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AMERICAN FRUIT GROWER

OCTOBER

TO PLANT OR NOT TO PLANT?—page 9

1945

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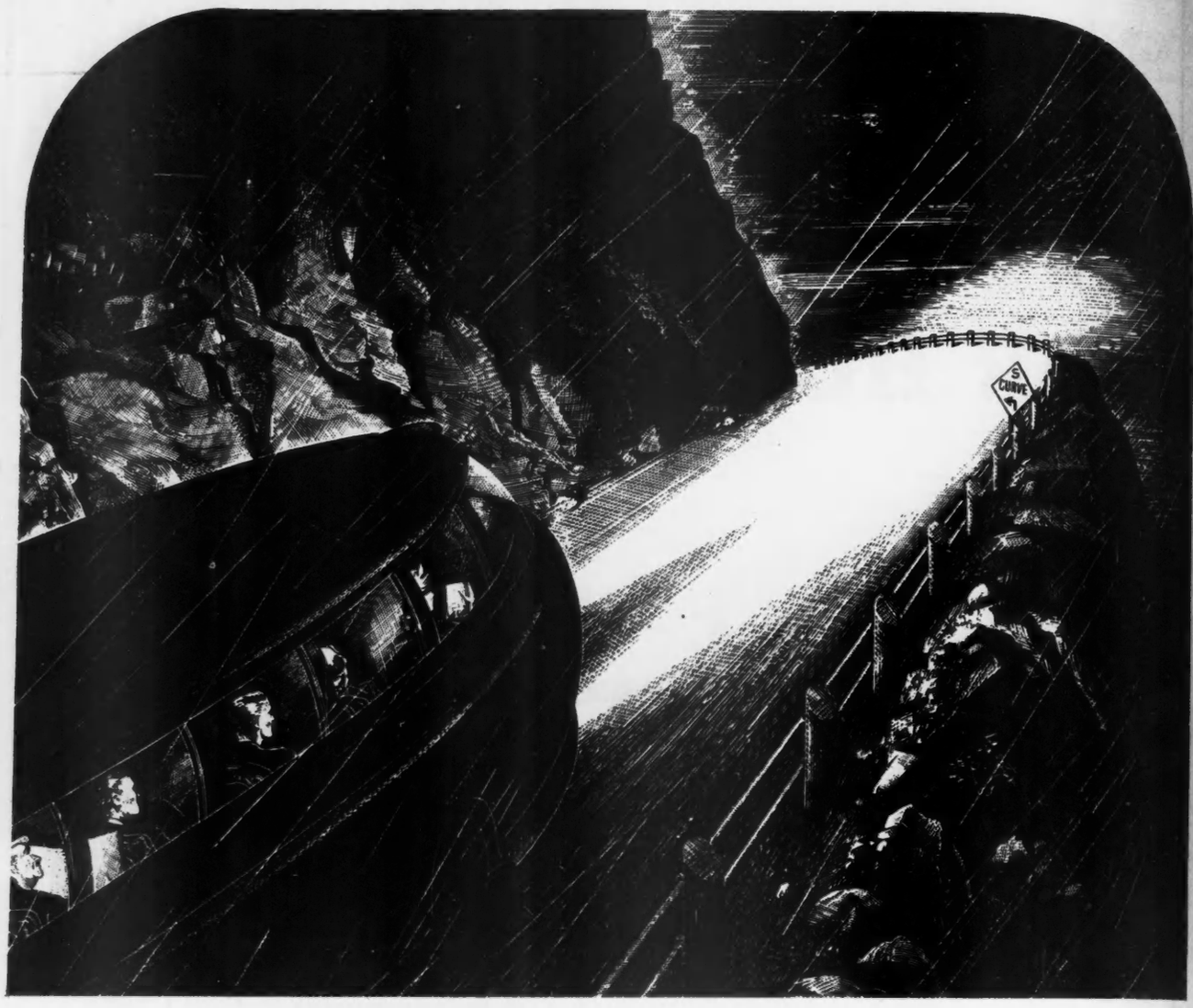

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LETTERS TO THE EDITOR

Picking With Two Ladders

Dear Editor:

I want to contribute to greater efficiency, hence, greater production—so here's an idea: Paper hangers use sty ladders (can be climbed from both sides). Now if fruit pickers will place two of these ladders next to a tree with a plank between the ladders connecting them, a picker can pick a whole side of a tree with much greater freedom and safety of movement by moving the plank up two or three times on the rungs of the ladders. Placing the two ladders but four or five times in going around a tree will "handle" it, it seems.

Murray, Utah — Eugene Middleton

This might work on level ground. Safety is always an essential in picking fruit.—Editor.

Poisoned Honey From Sprays

Gentlemen:

I intend to place my bees in the orchard and keep them there all the time. Is there any danger of honey being poisoned by the different sprays used in the orchard?

Clovis, New Mexico — E. J. Ferguson

Bees themselves and the brood within the hives are sometimes poisoned from arsenic and other sprays, but we don't know of any cases of poisoned honey from orchard sprays.—Ed.

The White Winter Pearmain

Dear Editor:

The apple described in your issue of July—this year—on the page of "Letters to the Editor" by Mrs. Minnie Thompson is the White Winter Pearmain. This apple appears in the list of trees you published in the April 1943 number of your magazine. It is a white, pink-cheeked, late winter apple that varies in color from green to white and pale yellow.

I have not seen this apple for forty years, but I was familiar with it as long as 57 years ago. It is a wonderful and delightful apple in its field, if grown under proper conditions. It could have a place in any man's home orchard, and make his heart glad, if he had plenty of bees to assure pollination. It is a difficult pollenizer but a huge bearer when bees are kept close by. It is one of those close seconds to Delicious in quality.

I am hoping someone will show up who can supply a twig or two for grafting this apple. It is one of my dream apples. And, by the way,—I nearly forgot to mention it —it is a true sheepnose apple.

Lingle, Wyoming — J. A. Woods

In the days of saddle-bag transportation, the White Pearmain, possibly better known as the White Winter Pearmain, was brought as grafts to the states of Ohio and Indiana by pioneers. Though the White Pearmain has been somewhat planted in the Far West, its cultivation is largely confined to the states mentioned. This apple is thought to be an old variety renamed, but what it is no one knows.—Ed.

Pink Blossom Strawberries

Dear Editor:

I have read your magazine for some time but now I would like to write for information.

We were given some strawberry plants a year ago last spring. This year they have berries on them. What we would like to know is if you can tell us the name of the variety? The leaves are quite a deep green and they seem extremely productive. The berries are real large. We have had a lot of heavy frost this spring but it hasn't seemed to hurt them, whereas it did the other kind we have. They have a pale pink blossom and the berry forms to quite a size while the blossom is still on. It is the only strawberry that we have ever seen that has a pink blossom and I thought that this characteristic would help to identify the variety.

Flint, Mich. — Mrs. Lewis Durr

Since we are not acquainted with this variety, perhaps there are readers who can give Mrs. Durr a hint as to its identity.—Ed.

Value of a Peach Tree

Dear Editor:

What would be the value of a large peach tree in the second year of bearing of medium size peaches? A railroad is building a right-away which will go through some of our peach trees. We want to know how to total up their value.

Drakesville, Iowa — Logan Harbour

The value of your peach trees would depend on the variety, the condition of the trees, the value of an acre of peaches in your locality, and other factors. Five dollars a tree would be approximately $550.00 per acre, which is as much as many desirable peach orchards would bring on the market. Two or three of your local peach growers might be able to give you the approximate value of an acre of such trees, and you could figure the tree value from that.—Ed.

Spraying Quince Trees

Dear Sir:

I wonder if any quince grower can suggest what action to take when the edges of leaves start to curl and then the leaves themselves gradually turns a sickly yellow?

This condition has started on a tree which last year bore the largest individual fruit. Only the bearing limbs are affected; therefore, it would seem that the quinces themselves are responsible.

Hopatcong, N.J. — Harry B. Watson

The chief pests on quince trees are usually black rot, blight and Oriental Fruit Moth. The trouble you describe sounds a little like aphis injury which has been particularly bad this year where the weather has been cool and wet. Thorough spraying of your quince trees according to the New Jersey spray schedule should be followed.—Ed.

GET BETTER RETURNS FROM EVERY TREE!

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Better Quality!
Better Yields!
Better Coloring!

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Growers report unusual results when they switched to this complete plant food!

● Top prices for top quality fruit! That's what growers from coast to coast report they've been getting through the remarkable growing power of Vigoro.

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TO PLANT OR

Opinion of Horticultura

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NOT TO PLANT?

Leaders Is Generally Favorable

In attempting to answer a few of the questions that have arisen in the minds of fruit growers this fall, the AMERICAN FRUIT GROWER has conducted a planting poll of the horticultural experts. The consensus of opinion on the extension of fruit plantings in this postwar period seems to be fairly general. The specialists advise that whether or not a grower extends his fruit plantings depends on his own local conditions; that the grower should weigh all conditions and facts pertinent to him before he plants, and then proceed with caution.

To the question, "should plantings be extended?" Professor V. R. Gardner, Director of the Michigan Experiment Station, answers "yes and no." Professor Gardner clarifies his answer by saying, "There are certain areas where conditions, either from a production or marketing standpoint, are favorable where perhaps substantial expansion is warranted with fruits of certain kinds. The large scale expansion of, say, plums or cherries or apples would probably result in headaches and loss rather than in satisfaction and profits. Furthermore, expansion should be limited to those who really know something about the business . . .

"Many years ago when I was a boy in the grade schools we were compelled to learn certain famous sayings. I don't remember very many of them but one has stuck with me throughout the years. It is this—'The winds and waves are on the side of the ablest navigators. There have been many 'winds and waves' in the fruit business in recent decades. There will be many in the years to come. It is all right for the able fruit navigator to put out to sea, but for anyone and everyone to launch out in the fruit business is dangerous."

Following much the same line of thought, Dr. H. B. Tukey, Head of the Department of Horticulture at Michigan State College, states, "It is an old axiom that the most money in orcharding is made by those who plant trees when they are selling at bargain prices, which is only another way of saying that the man who plants when nobody else is planting, is likely to have an orchard in bearing during a period of low production. Still, the future is always good for the well-trained individual with ability, located in a favored horticultural setting; it is seldom good in an unfavorable horticultural environment. Every day I am more and more impressed with differences in individual abilities and in orchard locations. In general, I am afraid of booms and over-expansion, but the conservative, long-time outlook for fruit is good. The shortage of nursery stock and other natural conditions have reduced new plantings seriously, so that it will be a little time before folks can plant heavily, even though they may want to. When that time comes, a careful, conservative point of view will be healthy to possess."

When a grower faces the problem of further plantings, Dr. R. A. Van Meter, Head of the Division of Horticulture at Massachusetts State College, thinks the following questions are pertinent: "Could you, a successful fruit grower, handle more trees without an appreciable increase in overhead expense? If you have all the machinery necessary and all the buildings you would need and time to manage the increased business well, you probably could grow fruit at a lower cost per bushel if you had more trees. There are thousands of successful fruit growers in this position. Have you suitable land that could be planted without disrupting some other equally profitable farm enterprise? If so, you should seriously consider planting more trees regardless of the market at the moment. No matter what happens you would be in a better competitive position than you are at present. That is the acid test."

Samuel Fraser, Secretary of the International Apple Association, points out that apples have undergone a very serious readjustment since the quantity of seedlings available has been limited for years due to the war. Since more will soon be available, Mr. Fraser predicts that the production of trees will be stimulated and while direct attention has been given to reduction of the production during the past years, it will take a decade to grow the trees and get them into bearing. There is always the possibility, thinks Mr. Fraser, that we may overexpand as we did before.

C. E. Chase, Secretary-Manager of the Washington State Apple Commission, believes that the apple industry faces a very prosperous period for at least the next ten years. Says Mr. Chase, "I am basing this on the increased demand for apples which had been secured prior to the war period. It would take 10 years to increase the plantings to the point of production and during this period production will decrease rather than increase. With the many new uses for apples I do not feel that the supply would ordinarily take care of the demand. . . . I am basing my opinion, that apples are the best fruit for planting at the present time, from my knowledge of present production and demand. I don't believe anyone can go wrong in planting an apple orchard of dependable varieties where the climate and conditions are favorable."

"Let us remember above everything else that plantings made now will not be felt until 5 to 10 years *after* the war." This is the advice of Dr. I. C. Haut, Associate Pomologist of the University of Maryland. Dr. Haut further advises that "Among the deciduous fruits, reasonable new acreage can be set in apples with safety, assuming consumer consumption at approximately the 1940 level will prevail. Wherever possible, these plantings should be made to long-keeping varieties. The point is that although total apple production has gradually declined for some time, we have had, during the past fifteen years, an actual increase in production of some eighteen to twenty million bushels of those varieties (Delicious, Jonathan, McIntosh, Cortland, Golden Delicious) which it has been necessary to dispose of in large measure by the first of the year. Moreover, a further trend in this direction is inevitable for some time to come. With 66 percent of Virginia's Winesap trees set before 1910, with approximately 50 percent of Washington's Winesap now over thirty years of age, with over 60 percent of California's Newtown over thirty, and with such Baldwin, etc., remaining in the upper age brackets, we are rapidly facing a situation where we will be forced to extend the storage season somehow or expect the consumer public to dispose of the bulk of our crop in four or five months. It will be difficult indeed to expect an increase in yearly per capita consumption by giving our consuming public a shorter and shorter time in which to eat them—at least in prime condition. Not only has the entire trend been away from inherently longer keeping varieties, but simultaneously from

(Continued on page 19)

Where erosion is in evidence, planting programs calls for the use of the contour system.

DESIGN FOR ORCHARD PLANTING

A SUCCESSFUL ORCHARD BEGINS WITH A FAVORABLE LOCATION, GOOD SOIL AND PROPERLY-PLANTED TREES

Choosing the Site

ASIDE from the choice of variety, the selection of the site or location of the fruit planting is the most important item to consider before actual planting begins. Regardless of the region in which you may be located, there is some variety of fruit which will fit your soil and climatic conditions. The objective is to choose that which will most likely survive the rigors of the climate and adversity of soil conditions. There are a few favored areas in the United States where fruits of many kinds can be grown abundantly. And here we find the concentrated fruit sections, such as Wenatchee Valley, Imperial Valley, Shenandoah Valley, The Great Lakes region, and the Hudson River Valley area. These intensive fruit sections have developed largely from the very favorable climate of the particular region. For the most part, the soils have been ideal for fruit growing, but care must be taken in selection of site even in the more favored areas.

Climate may be a determining factor to consider in planting a large commercial orchard, but it is not a factor which will completely eliminate fruit growing in any area which does not possess an ideal climate for such an enterprise. Climate may eliminate one kind or variety of fruit, but another may be found which will do exceptionally well. Horticulture is indeed a field of versatile enterprises. Regardless of climate, there are some who will attempt the cultivation of fruits if other conditions can be at least partially satisfied. The specific site or location of the planting thus becomes of major importance.

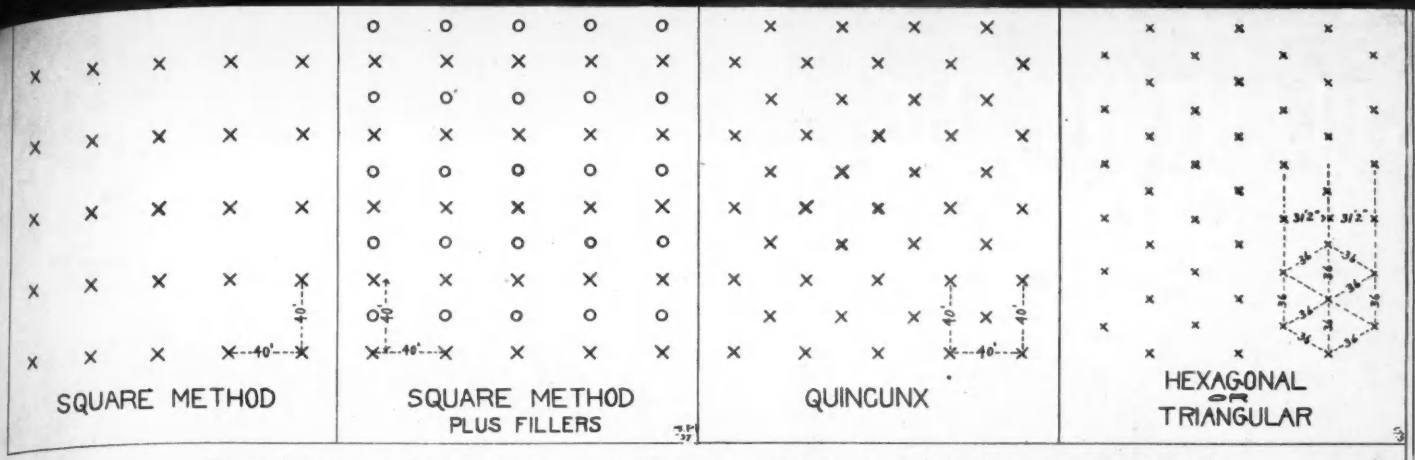
The soil is a determining factor in selecting the specific site. What kind of soil is best suited to fruit growing? A good orchard soil is well-drained, fairly fertile but must not dry out during the growing season. A few criteria may help to determine whether a soil is well-drained. Should the soil be very alkaline two to four feet below the surface, it is an indication of poor drainage and unsuitable land for fruit growing. In a few areas in the United States, magnesium charcoal concretions may be found a few feet below the surface. Such a condition also indicates poor drainage. Also, if iron accumulates in the soil it is an indication of poor drainage. Should a black, peat-like color develop on the surface of the soil, especially after rains, you may be sure that it is unsuited for fruit production. Other soil characteristics may be used to determine whether a given soil is well-drained. The advice of farmers or fruit growers in a given location as to the kind and drainage of the soil should always be sought before making a planting in a new area.

It is almost axiomatic to say that an orchard should be planted on northern slopes, broad ridges, upland plains and never in low areas. This is especially true throughout the East, Mid-west and North. The great valleys of the Pacific Northwest, California and a few other favored spots may be exceptions to this general rule. The choice of a northern slope is usually made because the trees will blossom later in the spring and thus will escape late spring frosts. High elevations in relation to surrounding territory are selected for orchard sites because such a location provides good air drainage through the orchard and thus prevents the development of frost pockets which would cause great damage. Ordinarily the atmospheric temperature decreases one degree for each 300 feet rise, thus giving some advantage in delayed blossoming on the higher elevations. Air movement is also important in this respect.

Soil reaction, that is, its degree of acidity or alkalinity, is frequently considered in choosing the orchard site. Most fruits will grow on soils having a wide range in soil reaction, but the optimum is considered to be near a pH of 5.5 or higher.

It now becomes clear that a good orchard site is one that is high enough for good air drainage and has a soil of moderate fertility, of good structure to permit good water drainage and easy root penetration, but is well-supplied with moisture during the growing season. Nothing has been said concerning the location of the orchard in relation to markets. In establishing a commercial orchard it is

Proper heeling-in of nursery stock in a protected spot that is not wet or water-logged prevents drying out of roots if the trees are to be held for a short period before planting.



Of the four systems of laying out an orchard, the square method shown at left has been most generally used.

always a good policy to consider the method of marketing or access to large urban markets before making the plantings.

Preparing the Soil

Land that is to be planted to orchards should be well-prepared in advance of the actual setting. Many of the good orchardists will grow one or two crops of soy beans or some other soil building crop just previous to planting. Such crops disced into the soil increase the organic matter content and improve the structure of the soil, creating a better medium in which the tree roots are to grow and feed. The prospective orchard site is ordinarily plowed and worked down just as for planting any cultivated crop. Then it is ready for the actual planting operation.

Laying Out the Orchard

The orchard plan which is to be used as the guide in planting, must be made with care. Apple orchards must be planned to give adequate cross-pollination. However, this is not so important with other tree fruits, most of them being self-fertile. The orchard must be planned according to the type of cultural system to be followed. In many hilly areas new plantings are being made on the contour and the hillsides terraced to conserve soil and moisture. Such orchards have been very productive and profitable.

Four different systems have been used in planting apples, and other fruits to some extent. These four, the diagonal or quincunx, hexagonal or triangular, the square and the square with fillers are illustrated here. These methods have been adapted where each has proven some advantage point to the orchardist. Some are more difficult to lay out than others, some permit more trees per acre than others, and some present cultivation problems. Each grower must choose the one that fits his planting plan best.

The advisability of using filler trees in an orchard is up to the individual grower. The objective in using filler trees is to obtain a larger income from the orchard before the main planting comes into full production. However, "fillers" may make spraying, cultivation and other operations more diffi-

(Continued on page 25)

Before setting the tree all broken or excessively long roots should be removed from it.

The young tree is held carefully so that it is set about as deeply as it stood in the nursery.

Soil is made compact so there will be no air spaces and so roots will be firmly set.

The tree is pulled up and down so that fine soil can settle thoroughly among small roots.

Peat moss may be used with the soil but in n case should fertilizer touch the root-syster

PLANTING THE GROVE

FROM THE SOUTHEAST COAST TO THE WEST COAST, PLANTING TIME OF CITRUS FRUITS VARIES WITH LOCAL CONDITIONS. PLANTING JUST BEFORE THE DRY TIME IS TO BE AVOIDED, HOWEVER.

Discing in a newly-set Florida orange grove where trees are commonly spaced about 25 ft. apart.

CITRUS culture in the United States is indeed a highly-specialized industry. Success is assured only by applying specialized technical knowledge. Even though the planting of the grove is but one phase of the complete cycle, it must be done wisely for a poor planting cannot be corrected by even applying the best cultural practices.

Citrus fruits are grown primarily in California, Florida and Texas with limited plantings in Arizona and Louisiana. Naturally the specific locations vary as do the soil conditions from one state to another. What are the requirements of citrus trees in regards to soil and climate? Locations where frosts and light freezes are more or less regular are to be completely avoided. In some citrus sections it is impossible to locate where there is absolutely no danger whatever from frosts, but the risks can be greatly reduced by a favorable location with respect to air drainage.

For example, an ideal location from the standpoint of good air drainage would be on sloping land or on the higher elevations surrounded by low areas. This permits the cooler air to settle from the grove into the low areas, the places where frosts are most likely to occur. Even a few feet rise may make a difference between frost and no frost. Groves set in close proximity to large bodies of water have the advantages of frost protection, too.

A well-drained soil of open texture is ideal for citrus culture. In Florida such a soil is to be found in the high pine lands and the high hammocks. These terms refer to the type of native trees which the soils supported. The hammocks grew hardwoods and the pine lands the pines. The low hammocks and flat woods of Florida are not good grove locations.

In California the best soils occur on the higher levels and among the foothills. Here it does not matter whether they are red soils, granite soils or sandy loams, so long as they are well-drained and can be irrigated. Much of the native soil cover in California citrus sections was of cactus, sagebrush, and similar semi-arid plants. Soils that are very alkaline should be avoided, as should heavy clays and soils underlaid with a hardpan. The soils of the lowlands contain more organic matter but the quality of fruit is not as good as that produced on uplands.

The good citrus soils of the lower Rio Grande Valley are of a silty or sandy nature. In native state they bore mesquite, cactus, ebony, tornillo and other plants of arid and semi-arid climates. In Louisiana, the rich alluvial soils of the Mississippi delta support good citrus growth providing they are well-drained. Frequently drainage is necessary before planting.

Due to the fact that some of the citrus areas are subject to high winds, windbreaks must be planted at the time the grove is set. In Florida, the cabbage palmetto and other native trees are planted along river banks and along groves for this purpose. An artificial brake of slats may be constructed to serve the same purpose. In California the Monterey Cypress, pepper-tree, gum and silk oak are used for windbreaks. A twelve or fifteen-inch ditch is usually dug between the windbreak and the grove to prevent the windbreak trees from interfering with the growth of citrus trees.

If a piece of virgin land is to be used for the grove it should be cleared the winter before planting begins and a good legume grown just previous to planting. In any case, it is a sound practice to grow a soil building crop such as beggarweed, velvet beans or cowpeas and to work them into the soil in preparation for planting. It is better to disc the crop into the soil than to plow it under. Such a practice incorporates a quantity of organic matter with the soil which aids in getting the young trees established.

The planting distances of citrus trees vary with the amount of rainfall of the area, soil moisture, soil fertility, kind of rootstock, variety and the necessity of frost protection. In general, orange and grapefruit trees are spaced from 24 to 26 feet apart, lemons from 18 to 20 feet apart in rows 22 to 26 feet apart, mandarines or tangerines from 15 to 20 feet apart, limes from 22 to 26 feet apart and kumquats from 10 to 12 feet between trees.

Citrus trees are not periodic in their growth like deciduous trees, but make several growths a year. This makes planting possible during any one of the dormant periods providing the soil and weather conditions are satisfac-

(Continued on page 28)

PLANTING THE VINEYARD

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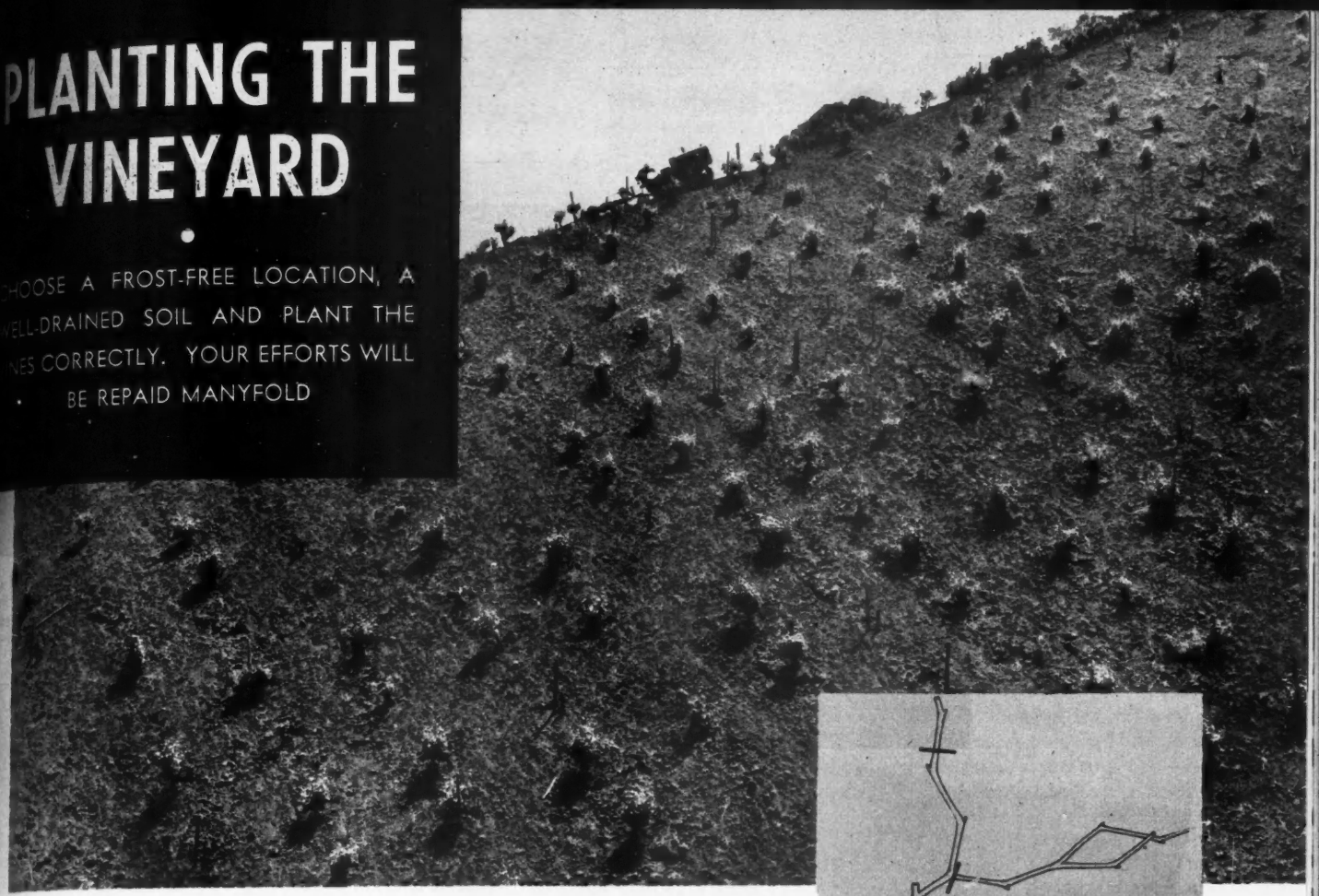
CHOOSE A FROST-FREE LOCATION, A WELL-DRAINED SOIL AND PLANT THE VINES CORRECTLY. YOUR EFFORTS WILL BE REPAID MANYFOLD

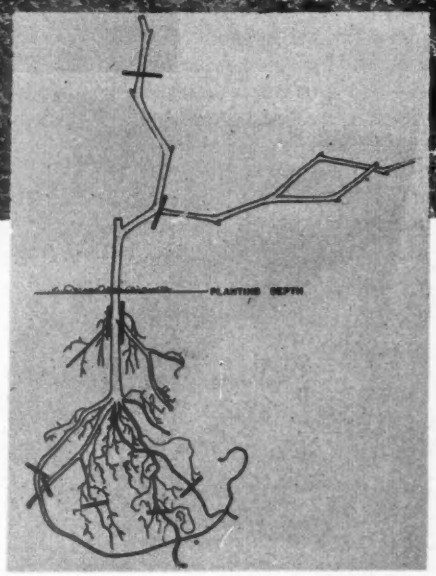


GRAPES of one kind or another can be grown in any part of the United States. They thrive under wide variations of soil and climate. But this does not mean that a particular grape or a given variety will grow prolifically wherever planted. Careful thought should be given to the specific location of the vineyard. In the past, many vineyards have been located on poor sites and have proved to be burdens on the industry and the grower rather than assets. Occasionally an old vineyard is pulled out and a new one immediately set in its place. Such plantings have so often turned into failures that the practice has been abandoned by good grape growers. Instead of making the planting immediately, cultivated crops and soil-building crops should be grown for two or three years.

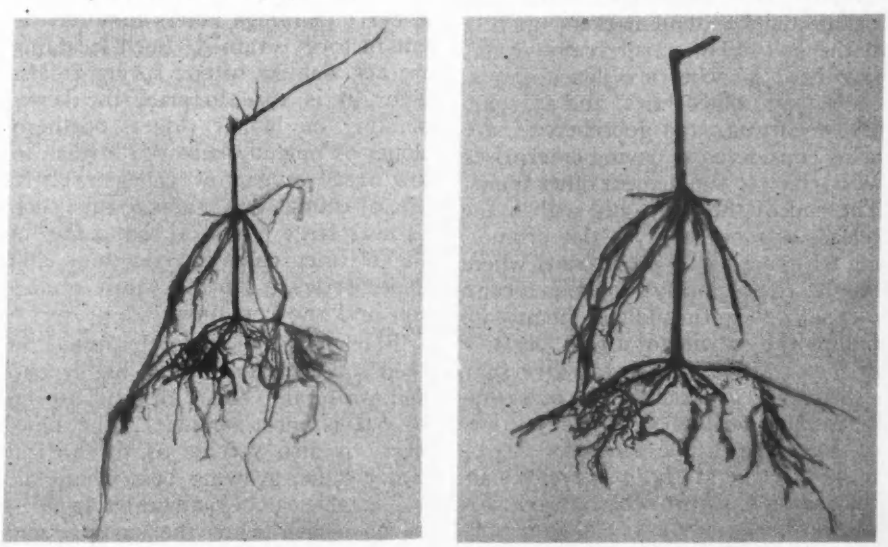
American grapes are grown on a wide variety of soils, doing best on moderately fertile sandy or gravelly loams that are well-drained. Good water drainage is of great importance in any soil. For prevention of frost injury the vineyard should be located on land somewhat higher than the surrounding territory. This gives the cold air a chance to settle below the vineyard, thus preventing frosts in late spring. This is no guarantee against frost injury, however. The large commercial plantings of American grapes are found in the very favorable climates of the Great Lakes region, the Hudson River Valley and a few other smaller areas.

Ordinarily one-year-old plants with a well-developed root system

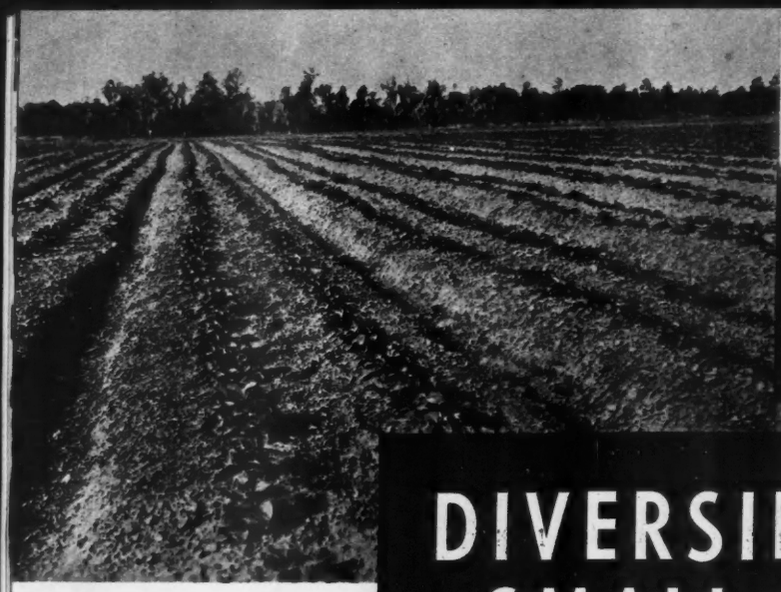
(Continued on page 29)



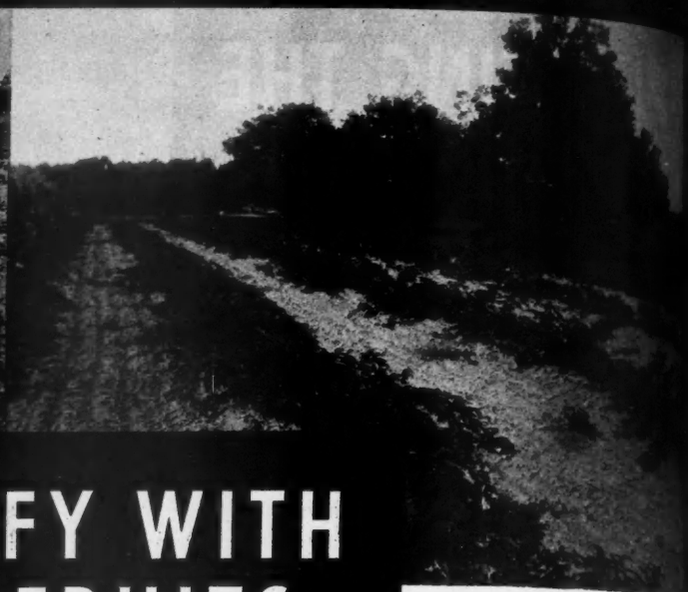
One-year grape plant pruned to two buds at planting time. Roots are pruned as shown by black marks. Photo—Ohio Extension Service.



A well-rooted grape cutting (left) as it was received from the nursery and (right) as it was pruned for planting. Photographs from the New York State College of Agriculture.



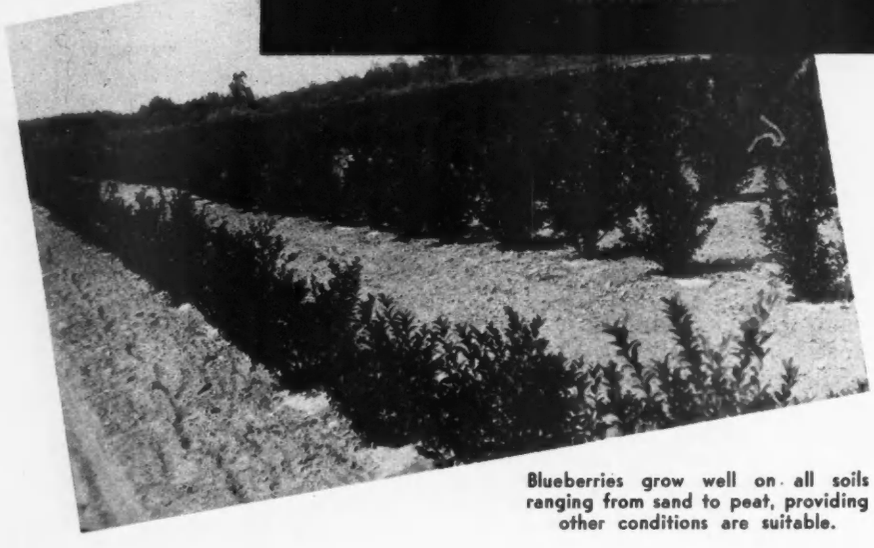
The double row system of planting strawberries is commonly used in Florida and other Southern states. Photo—Florida Experiment Station.



Rows of raspberries against an orchard background typify the fruit farm diversification trend in many orchards.

DIVERSIFY WITH SMALL FRUITS

SELECTED PLANTINGS MEAN MORE FRUIT



Blueberries grow well on all soils ranging from sand to peat, providing other conditions are suitable.

WITH the growing tendency to diversify fruit plantings, to increase income and to extend markets, interest in the culture of small fruits is expanding. Strawberries, blackberries, raspberries, blueberries, and to some extent currants and gooseberries, are being considered as paying enterprises with which to supplement other fruits. The end of the War, and with it the release of more labor, is also promoting the planting of small fruits where they were previously grown on a commercial scale. In addition, many are finding the growing of a few "berries" in their gardens a pleasant diversion.

Strawberries, blackberries and raspberries do well upon a wide variety of soil types. The ideal soil seems to be a fertile sandy or gravelly loam that holds moisture well and is easily tilled. The easily worked light soils tend to produce earlier berries. The heavier clay soils are also satisfactory but frequently are not as well-drained as other types of soils. Low, wet or poorly-drained soils are to be avoided in berry plantings unless they can be satisfactorily drained. Such locations are also subject to late spring frosts. Thus, it is wise to place the berry planting on higher ridges, northern slopes or upland plains rather than in low areas or narrow valleys. There are, of course, exceptions to this, such as near large bodies of water and in the warmer climates. Currants and gooseberries in general require similar soil and site conditions.

Blueberries are very specific in their soil requirements. A highly acid soil, preferably one with a pH of 4.0 to 5.0 is most suitable. The blueberry is also specific as to the soil water table, growing best where the water table can be maintained from 14 to 22 inches below the surface, and from 10 to 12 inches during the growing season. Blueberries grow well on all soils ranging from sand to peat, providing other conditions are suitable. Recently it has been found that they will also grow on the heavier clay soils providing the soil is sufficiently acid.

Before setting strawberry plants, the grower must decide which system of training he is to follow. In the South two systems are in general use, the hill system and the matted row system, the former predominating. The matted row prevails in the Northern and Eastern states, while the hill system is preferred in the Pacific Coast states.

Under the hill system the plants are generally set in single rows but some are planted in double or triple rows. When planted in the single row, plants are spaced 12 to 18 inches apart in rows 3 to 3½ feet apart. When in double rows the plants are spaced the same in the rows but the two rows are 15 to 24 inches apart with 2 to 4 foot alley-ways between each pair of rows.

Plants set in the matted row are spaced from 18 to 24 inches apart and the rows approximately 3½ feet apart. All runners are permitted to root, making the matted row. A good fruiting row will be from 15 to 20 inches in width.

The following table gives the general planting distances for the various small fruits:

	In Row Feet	*Between Rows Feet*
Blackberry	2½-3½	8 -10
Red Raspberry	3 -4	7 - 9
Black, Purple, Raspberry	2½-4	7 - 9
Strawberry	1½-2	3½- 4

Blueberry plants lifted out of the ground by freezing of the soil. This location should have been drained before the plants were set. Photo by Massachusetts State College

Strawberry rows should be planted far enough apart to allow good cultivation. The garden tractor is a good tool for use in small plantings.

Currant	4 -5	7 - 9
Gooseberry	4 -5	7 - 9
Dewberry	2½-5	2½- 7
Blueberry	4	10

To determine the number of plants per acre, one need simply make a simple calculation as directed in the accompanying article on Orchard Planting. The following table gives results of some of these calculations:

Planting Distance	*Number plants per acre*
1 x 4	10,890
1½ x 3½	8,300
3 x 8	1,815
3 x 9	1,613
4 x 8	1,361
4 x 10	1,089
8 x 10	544
10 x 10	436

One-year-old plants are generally considered best to plant with the exception of blueberries. Two- or three-year-old blueberry plants have proven more satisfactory than younger plants. The soil should be plowed and worked down just as for planting any cultivated crop. Spring planting is generally the rule with practically all berries, but many growers are successful with fall planting especially on the Southern sandy soils. Fall plantings should be thoroughly mulched with straw over winter to prevent heaving out of the plants.

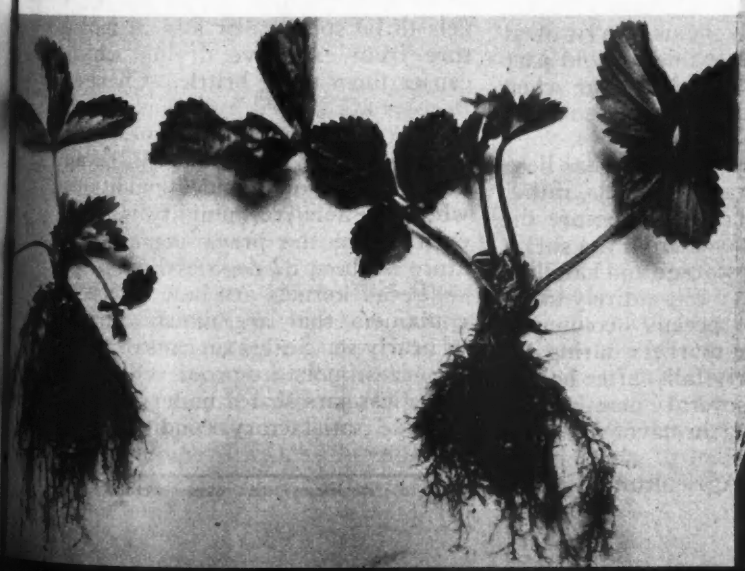
The brambles are ordinarily set by hand using a spade. A plant setter has been used in a few instances, but the plants are usually too large to fit in the shoe of a setter. Commercial strawberry growers use a mechanical setter, but a few set by hand.

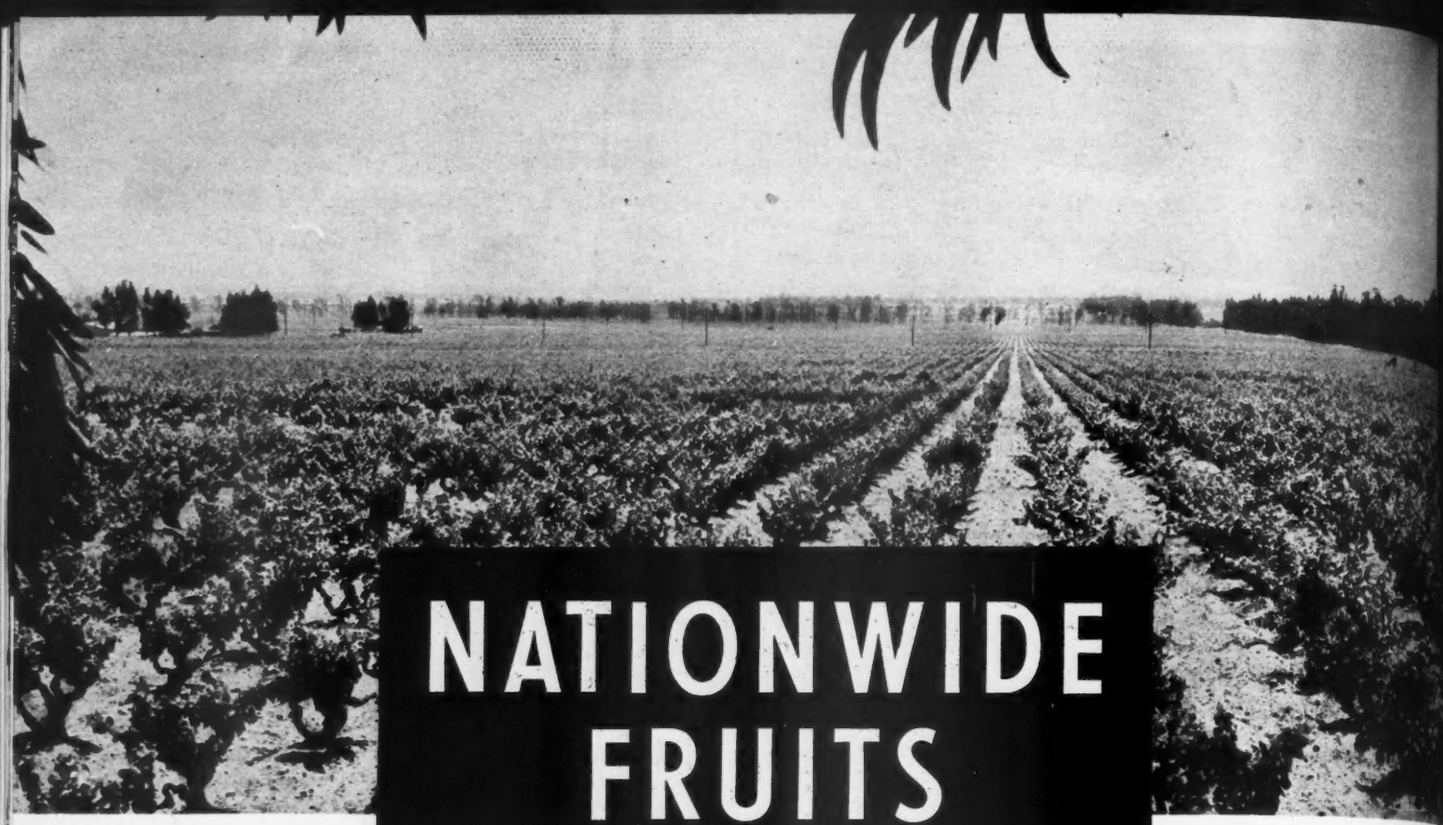
Strawberry plants should be set at the same depth they previously grew in the nursery row. The crown of the plant must not be covered with soil, nor should it be set so shallow that the roots will dry out. Brambles, gooseberries, currants and blueberries should also be set at the same depth they formerly grew in the nursery row, or slightly deeper, up to about 2 inches deeper is considered satisfactory. No manure or fertilizer should be applied around the roots at planting time. The pieces of old cane, "handles," should be removed from raspberries after planting. Little or no root pruning is the general practice on all of these plants.

(Right) Individual plants at Dorsett. Left—spaced 8 inches, 266 plants per 100 square feet. Right—from a matted row containing 1190 plants per 100 square feet.

(Below right)—The center strawberry plant is set at the proper depth, the one on the left too shallow, and the one on the right too deep.

(Below left)—Left, a good type of a strawberry plant for setting; a good root system and medium sized top. Right, a poor type of plant; it grew too much before digging and has too small a root system.—Photos — Massachusetts State College.





NATIONWIDE FRUITS

GRAPES

Fifth National Wine Week

National Wine Week will be revived this Fall to mark the launching of the grape and wine industry's postwar program of expansion, marketing and re-employment. The dates will be October 15th to 22nd, 1945.

Decision to hold the annual vintage event was made by industry leaders to comply with the national call to all industries for conversion as quickly as possible to full peacetime operation, in order to provide the maximum number of jobs and to resume the normal flow of commodities.

More than 30 allied industries will join with wine growers and vintners throughout the nation in Wine Week observances and merchandising events.

Hotels, restaurants and stores will feature American wines. Many wineries will re-open their doors to visitors, and in some communities the ceremonies marking the vintage season will be resumed.

It will be the fifth annual observance of National Wine Week which started in 1939 and was interruptd for two years during the war.

"In launching its postwar program," said Harry A. Caddow, Secretary-Manager of the Wine Institute, "the grape and wine industry emerges from the war period in the soundest position in its history, with its wines greatly improved in quality to meet European competition and with millions of American consumers who have discovered in recent years that the products of their own country's vineyards are as desirable as any from foreign lands.

"The wine growing expansion program will include enlargement and rebuilding of production facilities, increased plantings of rare grape varieties for premium quality wines and campaigns for extended export markets."

PECANS

Storage of Shelled Pecans

Pecan crops tend to alternate with heavy and light crop years. Therefore, when the crop is heavy, it is usually more profitable to hold part of it until the following year when the crop is likely to be light and better prices prevail.

In recent years the trend has been to store the extracted kernels, rather than to store the pecans before the kernels are removed from the shells. The methods of storage and handling pecans have not been entirely satisfactory since pecans commonly available on the markets during the summer and early fall—after having been stored several months—are often dry, strong in flavor and dark in color.

In a Texas Agricultural Experiment Station bulletin entitled "The Storage of Shelled Pecans," Fred R. Brison, Professor of Horticulture at the A. and M. College of Texas, has given the results of tests begun on pecan storage in 1936 to determine conditions suitable for storage and to study the causes of deterioration of pecans in storage.

A few of the conclusions drawn from these tests are: "Shelled pecans may change in flavor, texture, and color, while in storage. They may also change as a result of insect or disease damage. Kernels change in flavor by becoming progressively rancid and by absorbing odors from other products. Rancidity may be largely prevented by proper storage at low temperature. Changes in texture are caused by absorption of moisture, which causes the kernels to be spongy; or loss of moisture from excessive drying which causes them to be brittle. Changes in color are caused by rancidity and by exposure to ammonia fumes. Blue mold is likely to develop if pecan kernels are stored under conditions where the relative humidity is high, even where the prevailing temperature is about 32 degrees F.

"Pecan kernels are best stored in containers that are moisture-proof or nearly so. Sealed tin cans of varying sizes, moisture-proof cellophane and glass jars sealed under vacuum, provide satisfactory conditions for storage.

APPLES

Treetops Depend on Rootstock

That apple tree tops vary in size, depending on the type of rootstock employed, is shown in tests carried out by the University Experiment Farm Orchard at Kearneysville, West Virginia.

R. H. Sudds, associate horticulturist of the Agricultural Experiment Station at Morgantown, West Virginia, reports that Jonathan is a desirable seedling for producing large tops of four standard varieties grown in the Shenandoah Valley . . . Gallia Beauty, Starking, Staymared, and York Imperial. .

Many farmers and city dwellers, however, prefer smaller trees because they have less room and less efficient spray equipment. Tests in the Jefferson orchard have included work with 11 seedling and 13 clonal rootstocks. Among these, says Mr. Sudds, there may be some that will induce tops of less than standard size on the stronger soils of the state. Among the varieties so affected are Starking, Staymared and York Imperial. "These should not require heavy pruning to keep the tree of manageable size, and they should be easier for the grower to spray and pick. Gallia Beauty and Rome Beauty on any rootstock will hardly become too large, no matter what rootstock is used," he states.

The oldest trees in the experimental orchard at Kearneysville are now in their thirteenth season. Their story is not complete and will not be for some time, according to the horticulturist. "The testing of appletree rootstocks takes quite a few years, but we are gradually getting information of considerable value to the industry," Mr. Sudds declares. "We shall be able to tell the grower what rootstocks should best be employed for certain purposes with several standard varieties. Equally important, we shall also be prepared to inform him what kinds of rootstocks should not be used for his conditions."

PEACHES

Determining Hardiness of Peach Buds

A quick, practical method of determining the relative cold hardiness of dormant peach fruit buds has been discovered. M. A. Blake and O. W. Davidson of the New Jersey Experiment Station and E. M. Meader, formerly with the Station but now with the Bureau of Plant Industry, Soils, and Agricultural Engineering, U.S.D.A., have established this reliable method which requires relatively simple equipment and takes only a few hours.

This is quite different from the old practice of growing a given peach variety through a number of "test" winters to determine its winter hardiness. Winter temperatures are simulated by the use of antifreeze solution and a commercial ice-cream refrigerator, with thermostatic controls of temperature to a low of —30 degrees in the compartment.

The peach buds to be tested for hardiness are put into the antifreeze and then placed in the refrigerator where they were subjected to various temperature changes. In this manner a number of relationships determining hardiness of peach buds are determined, such as the importance of the rate of temperature fall in development of cold injury, maximum and minimum temperatures which will cause injury under given conditions of the buds, and others.

The potentialities of such a rapid determination is obvious. It will aid greatly in speeding up breeding work involving winter-hardiness studies. It may even be of importance in ascertaining the extent of cold injury in orchards.

RASPBERRIES

Brown Berry A Virus Disease

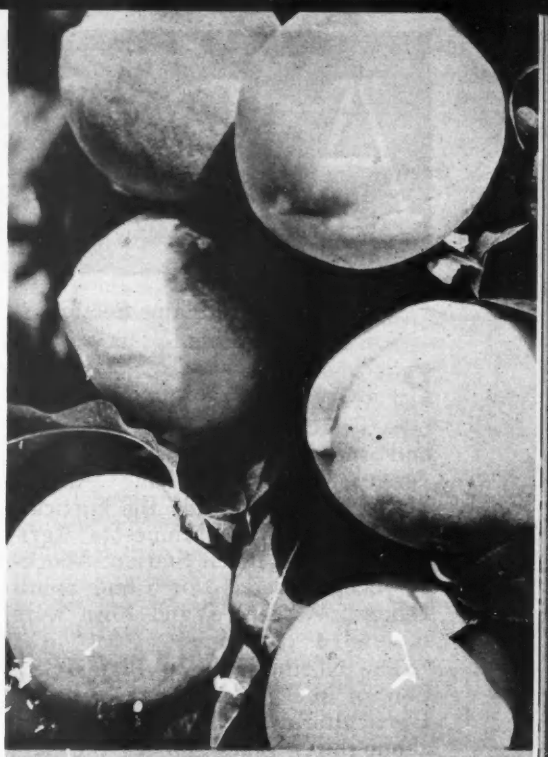
His firm belief in a "hunch" which he pursued over a period of several years recently rewarded Dr. George L. Zundel of the Pennsylvania State College with the discovery of a new plant disease affecting black raspberries.

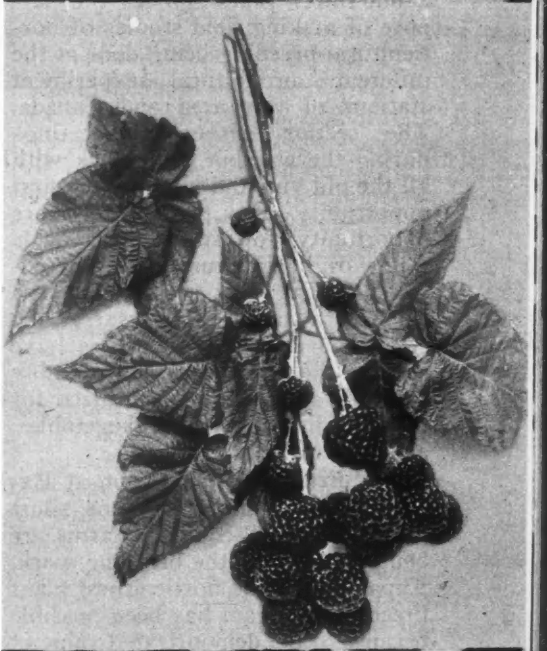
"Brown Berry," as it had been called, plagued growers and puzzled plant disease experts. Instead of maturing properly, the berries shriveled and turned brown.

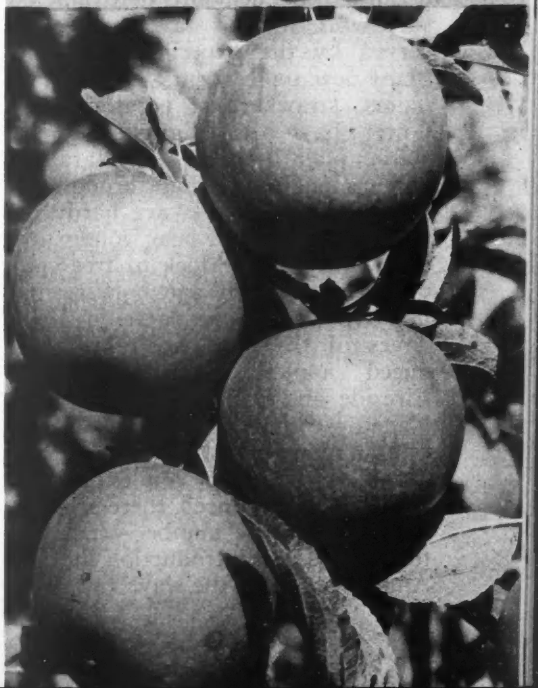
It was not until thi syear's berry crop was maturing that Dr. Zundel's observations were completed and final conclusions made.

Then he was able to announce that brown berry is a virus disease, or rather the symptom of a disease, the name for which has not yet been determined.

Because the disease can strike with varying degrees of severity, Dr. Zundel prefers to let it up to the grower's judgment as to whether to rogue out all diseased plants at once, or for the present save those from which he may be able to harvest a partial crop of berries while new and disease-free plantings are getting established elsewhere. In obtaining new plants, growers are advised to trace them through all handlers to their origin to make sure they are getting disease-free stock.







APS

A PAGE CONDUCTED IN THE INTERESTS OF THE AMERICAN POMOLOGICAL SOCIETY

Northern Great Plains Section Meets

PLANT breeders, plantsmen, and others interested in fruit, vegetable, and ornamental breeding met at University Farm, St. Paul, August 27, 28 and 29 to study the horticultural work of the Minnesota Agricultural Experiment Station. Workers from Canada, North and South Dakota, Wisconsin, and Iowa were there.

The Northern Great Plains Section of the American Society for Horticultural Science was organized about thirty years ago for the purpose of making field studies of horticultural breeding being done at the different agricultural experiment stations of this area and Canada. The section suspended meetings during the war but came back with all the old vim and vigor at the first opportunity. Few places offer more opportunity for study of a wide range of horticultural plant breeding material than is found at the Minnesota station. Professor W. H. Alderman and his co-workers have carried the torch and considerably over 200 acres are being utilized for the breeding of fruits, vegetables, and ornamentals.

The Fruit Breeding Farm at Excelsior is too much for one short visit. Two well-equipped farms are being devoted to the breeding work. Expansion in the horticultural plant breeding program has been possible because of the demonstrated value of such work for the state and region served by the experiment station. Many new apples, pears, raspberries, plums, strawberries, potatoes, and flowers have been originated by the station plant breeders. The Haralson apple is making good all through the area. Haralson trees are hardy on north into Canada, bear young and abundantly. One block of trees not over ten years of age bore twelve hundred bushels per acre in 1943. Trees of the more recently introduced apples, Victory, Minjon, Fireside, and Prairie Spy, were well-loaded with fruit. There was a short crop in many other varieties. In addition to those new apples already named and introduced, there are several others under number which are to be named for introduction shortly. And more are on the way. Over 500 new selections in the apple are undergoing second test plantings.

It is much the same story in the raspberry. Latham and Chief made raspberry history and are well known all over the country. Sixteen new cross bred varieties are under second test. Berries of greater hardiness and with more resistance to disease are the present ambition of the breeders.

Minnesota hybrid plums, plus those of the Hansen hybrids from South Dakota, now make up the varieties commonly grown in the great plains area. Growers find in them a great improvement over the natives formerly grown, but most of the hybrids are extremely susceptible to brown rot, and furthermore the fruit does not cook well. Past experience with the European (domestica plum) was that the trees lacked hardiness and were unfruitful.

The Minnesota station made a collection of 85 domestica varieties and seedlings, found 65 which were reasonably hardy and around 50 seemed worth extended testing. Many of these domesticas were in full fruit this year. The Mt. Royal (from Canada) looked like the best one of the lot. Past performance at the station indicates hardiness in the tree and in fruit bud. The fruit is 1¼ to 1½ inches in diameter, roundish oblate, blue in color, very good in quality, and ripe in the fore part of September. Krikon, of Swedish origin, is another hardy and productive sort. These domestica plums are a good foundation to start from in breeding better plums for the prairie regions. When new domestica varieties of good quality and hardiness are originated, it is predicted that the Jap hybrids now commonly grown will disappear just as rapidly as did the old native varieties when the hybrids came in. It appears that the domestica plum problem has at least been cracked.

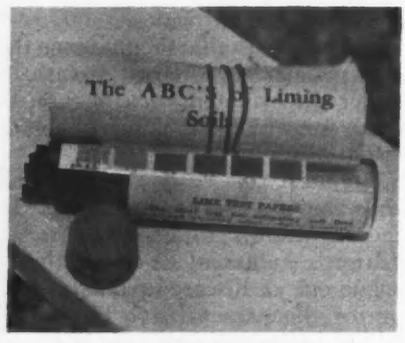
Believe it or not, new seedling peaches ripe on the tree were there, growing a good 300 miles north of the normal peach range in this region. Those ripe peaches were in some instances three inches in diameter, were handsomely blushed with red, and luscious in flavor. At Minnesota, the Marquette has proved to be a good parent, and several of the Iowa seedlings, too, have proved valuable as parent varieties.

It was the same story in other fruits such as the strawberry. The best introduction here is the Bergundy. A dozen new hybrid grapes have been introduced. Hardy cherries are on the way, even sweet ones.

Minnesota is to be commended for the fine support given this most excellent breeding and horticultural program. To Messrs. Alderman, Brierly, Wilcox, Currence, Hutchins, Longley, Wier, Winter, all members of the Division of Horticulture, congratulations for a job well done.

This is a sketchy description of the horticultural work of the University Agricultural Experiment Station at St. Paul and Excelsior as seen by your secretary, but I hope it will give the reader an idea as to the magnitude and significance of the work already under way in horticultural plant breeding in just one of the experiment stations of this continent.

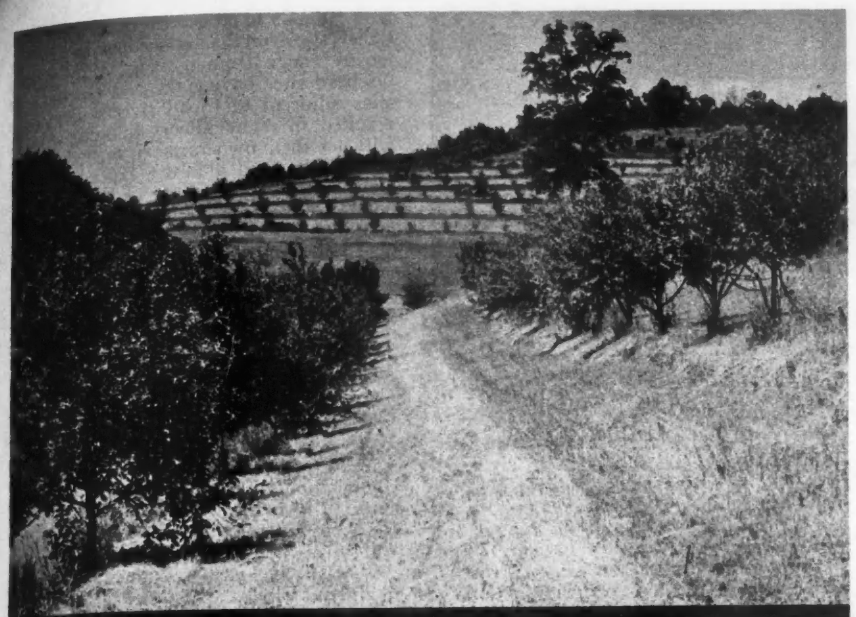
H. L. Lantz
Secretary



LIME TEST PAPERS

Liming fields that are too acid is a profitable investment since too acid soils cannot produce high crop yields. Progressive and scientifically-inclined fruit growers have long wanted an easy-to-do soil acidity test. LIME TEST PAPERS, developed by T. J. Longwell of Jackson, Tennessee, fill the need. They furnish an accurate, reliable basis of the utmost simplicity, for estimating soil lime need. This simple test clearly shows the degree of soil acidity.

"The ABC's of Liming Soils" is a booklet designed by Mr. Longwell which accompanies the LIME TEST PAPERS and which clearly and simply explains soil acidity and how to tell the degree of soil acidity. Crop Preference lists show the soil conditions preferred by crops and a Liming Table shows the lime needed to correct various degrees of soil acidity.



The strips in this contour orchard are cultivated in a 5-year rotation: Corn-oats-wheat-hay-hay. When this photograph was taken, it was in timothy meadow. Manure is spread following wheat to protect soil during bare period. SCS Photograph by: G. C. Lowery.

TO PLANT OR NOT TO PLANT?

(Continued from page 9)

those which had specific, and in some cases, meritorious culinary qualities to those which are essentially dessert varieties only."

Also speaking of apples, John Chandler, Executive Secretary of the National Apple Institute, is of the opinion that a gradual increase in planting by well-qualified apple growers is desirable in those localities where apple growing has proved profitable over a long series of years. "Although there have been outstanding technological developments in the apple industry, resulting in greatly increased quality and yield," says Mr. Chandler, "this has not offset the marked reduction in the number of living apple trees, as is shown by the gradual decline in the total apple production of the United States over the past 25 years."

Prefacing his remarks with the assumption that there will be no serious disruption in the normal economy of the country in the post-war period, Dr. Leif Verner, Head of the Department of Horticulture at the University of Idaho, has stated, "The future of fruit growing in the United States should, in my opinion, be very good, *providing* growers do not make the mistake of overexpansion of their acreages. There will undoubtedly be an expansion of the frozen pack industry which will make it possible to present to the consumer various kinds of fruits in different forms or at different times of the year than are now available. This should produce new market outlets and increase the total quantity of fruit to be consumed. However, if growers generally anticipate such an expanded market and increase their plantings accordingly, supplies may exceed demand to such an extent that many growers will find the industry unprofitable."

In the opinion of F. N. Fagan, Professor of Pomology at the Pennsylvania State College, the future of the fruit industry in the United States is going to depend largely upon purchase power of the world's peoples. "Theoretically," says Mr. Fagan, "there has not been overproduction of fruit in past years. There has been under consumption, however, throughout the world. During the last twenty years there has been a better understanding of the place fruits hold in human nutrition. This alone is going to make, in future years, the use of fruit in the diet more desirable.

"Better distribution to world markets will continue and the ultimate consumer will receive fruits in better condition in the fresh state, as well as in frozen, canned, dehydrated, and in juice. If the world's peoples' economic condition gives them purchasing power, there should be need for some expansion with all fruits produced in the United States."

B. S. Pickett, Head of the Department of Horticulture at Iowa State College, expects to see world markets for fruits grow gradually, but finally, to undreamed of proportions, and Mr. Pickett believes that the United States will get some share of the expanding world markets. "It is probable, however," he says, "that the demands from central and eastern Europe, for example, and from important segments of Asia, will be met by the development of local fruit growing areas or by shipments from nearer countries. We can scarcely hope to have new markets in the United States itself, since our distribution system now reaches practically all the remote spots in the country. In many fruits, however, our markets have not reached the saturation point by any means. If figs, dates and apricots could be supplied a little more cheaply, and the curing process be a little improved, our markets for these fruits could be expanded. The strawberry also has been slipping in commercial production for various reasons, and the market could carry a larger supply of this fruit than it has been doing in recent years. Frozen strawberries are a partial answer to the difficulties of distributing such a soft fruit."

What to Plant

As to the kind of fruit that can or should be planted, the horticulturists vary in their opinions with the localities in which they are located. C. L. Burkholder, Assistant Chief in Horticulture at the Indiana Experiment Station, reports that "Of the deciduous fruits, apples are the most popular and usually the easiest to grow and if there is an overplanting, it will show up first with this fruit. My suggestion is to increase plantings of fruit of which there is the least competition in the particular sales area covered by a particular grower." Dr. M. B. Hoffman, Professor of Pomology of the New York Extension Service, reminds us that present peach plantings are already heavy, and that plantings of apples and cherries may be a better bet. Dr. Hoffman emphasizes, as do all the horticulturists, that with any new planting contemplated, the fruit and the variety should be adapted to the soil, area, and market outlet.

Head of the Horticulture and Forestry Department, L. M. Ware of the Alabama Polytechnic Institute, tells us that in Alabama there are a good many areas especially well-adapted to fruits that might well be developed on a small commercial basis for supplying summer and early fall apples for local markets. This program is expected to be expanded in Alabama as there has been very good demand and a fair price for local apples for curb markets and towns of medium size. The varieties which would be planted in the main would consist of Red Delicious, Yellow Delicious, Bonum Red June (local variety), Fanny, and Mammoth Black Twig.

(Continued on page 22)

STATE NEWS

MARYLAND—Our peach harvest season was early and short. In some sections of the state the fruit finished off nicely, but brown rot caused heavy losses in some sections, in spite of efforts to control it. This was due to the rainy weather which washed off the sprays almost as fast as they were applied. There was a heavy outbreak of constriction disease which caused killing of branches back as far as three feet from the terminals.

After considerable planning and real effort, the growers of Western Maryland have obtained two laboratories that will greatly improve fruit growing in that section. One laboratory located at Hagerstown will run spray residue samples and spray load analyses for growers in the five western countries. This work was formerly done by the Department of Health Laboratory in Baltimore, which will continue to run residue samples for the remainder of the state. Another field laboratory, located at Hancock, will be used for research in insect and fruit cultural investigations. This laboratory will be in charge of Dr. C. O. Dunbar, Horticulturist, and Dr. C. Graham, Entomologist. These laboratories were formally opened and inspected by the Governor and other state officials, on August 24th.—*A. F. Vierheller, Extension Horticulturist, College Park.*

NEW HAMPSHIRE—The annual meeting of the New Hampshire Horticultural Society will be held on November 15 at the Carpenter Hotel in Manchester. The committee is considering the possibility of going back to the pre-war plan of holding a two-day convention, in which case the meeting will also be held on the 16th. Program details are gradually being worked out, with growers indicating interest in new machinery, cold storage facilities on the orchard locations, and the post-war marketing problems. With a small crop growers will not be involved in packing operations to any extent in mid-November, and President Daniel Batchelder expects one of the largest meetings in recent years.

A special committee of the Society is making a detailed study of the Horticultural Department at the University at the request of the Department Head, Dr. A. F. Yeager. The committee consists of Mr. Batchelder, President; A. L. French, Secretary; and James Colby of Litchfield, large vegetable operator. They will report the work of the Department to the Society's annual meeting.

Three outstanding fruit growers and past officers of the Society have recently passed on. They are Wallace P. Mack of Londonderry, past Treasurer; Robert T. Gould of Hopkinton; and William E. Putnam of Hancock, both past presidents.—*Alfred L. French, Sec'y, Concord.*

NEW YORK—Fruit growers in the State are cooperating with other farmers to raise an endowment fund of $100,000 for scholarships in the New York State College of Agriculture. These scholarships are to be named after the late Carl Ladd, former Dean of the College. They are aimed at encouraging boys and girls with the most natural ability, to attend the College of Agriculture, and to develop them as future leaders. New York fruit growers realize that more and more trained leaders will be needed in the future, and plan to start the selection and training of these future leaders as soon as possible.—*T. E. LaMont, Associate Sec'y, Albion.*

ILLINOIS—Apple prospects in Western Illinois are excellent and have improved considerably the past two months. Codling moth control has been excellent and most of the scab has faded out of the picture. With plenty of moisture apples are sizing up well and these warm days and cool nights are coloring up the fruit too.

Some sections will have more apples than they did last year with size and quality twice as good as last year. Jonathans, Grimes and Golden Delicious are especially heavy with winter varieties only fair.—*C. C. Mast, Sec'y, Quincy.*

INDIANA—Indiana was blessed with a fine peach crop in 1945. In addition, an excellent demand for well grown and packed fruit beginning with Jubilee and extending through the Halehaven and Elberta as far North as Vincennes harvest. The first cars of Elberta were loaded August 13 in the Vincennes area which was practically normal in spite of a blooming season nearly 4 weeks ahead of average. Many local buyers found it impossible to can as many bushels of peaches as they do ordinarily because of the sugar shortage.

The southwestern corner of Indiana came through the many spring frosts and freezes with from 25 to 50 percent of an apple crop. Other apple producing sections in the state mostly range from nothing to 25 percent. Orchard sites having the best elevations or sites adjacent to broad river valleys have resulted in many almost full crops which will net their owners more than the entire cost of the land plus the expense of trees and planting. The season of 1945 has demonstrated the folly of locating orchards on anything but the best of orchard sites.—*C. L. Burkholder, Purdue Horticultural Department, Lafayette.*

MAINE—The Maine State Pomological Society met at Bear Pond in North Turner on August 28. The morning session was devoted to discussion. Growers were interested in finding reasons for excessive leaf injury. It appeared likely that some injury was due to wind, some to lime-sulfur, some to water soluble arsenic, and some to combinations of causes. Surely the season supplied them all.

George Chick of the State Department of Agriculture brought us up to date on apple ceilings after much discussion as to what might be included as "graded apples." With none specified, a committee was appointed to draft into resolution the society's desire that ceiling prices be removed on this year's light crop. It was thought that this would not significantly increase the cost of living and that it would stimulate better grading and result in a better price distribution between low-grade and high-grade offerings.

Director Clarence Conant spoke with enthusiasm of his contacts with the work and the officers of the New York and New England Apple Institute. Stanley Painter told of current activities of the Maine Apple Committee, that it has become a standing committee of the Pomological Society and that its immediate special interest is the finding of new and better consumer packages for apples.—*J. H. Waring, Professor of Horticulture, Orono.*

LESSONS IN ORCHARD CHEMISTRY

By E. W. WITMAN, Research Associate
Ohio State University Research Foundation

What is calcium arsenate? What insects does it most effectively control? How does it differ from lead arsenate? These questions are answered in this second of a series of articles on orchard chemicals written by Dr. E. D. Witman, Rsearch Associate, Ohio State University Research Foundation.—Editors.

CALCIUM ARSENATE

Calcium arsenate was first proposed as an insecticide in 1910. Its major use is on cotton but it is sometimes used for the control of other chewing insects.

As with lead arsenate, the manufacture begins with arsenic pentoxide, a product resulting from the combination of arsenic trioxide with oxygen. The arsenic pentoxide is then made into a solution and added to hot "slurry" of slaked quicklime, followed by drying and grinding to a fine powder. It is cheaper than lead arsenate, yet contains nearly one-fourth more arsenic. Reliable manufacturers produce a uniform product in spite of the fact that the exact chemical nature is unknown. Commercial calcium arsenate usually contains up to about 10 percent free lime.

Moisture, especially in the presence of carbon dioxide, liberates relatively large quantities of soluble arsenic from calcium arsenate, and thus, tender foliage is likely to be injured. Lime is generally used as a "safener".

Calcium arsenate is compatable with sulfur, lime sulfur, bordeaux, basic copper sulfate and nicotine, but it should not be used with soaps—and it is questionable to use it with rotenone.

Calcium arsenate is an efficient insecticide for beetles since their acid digestive tracts readily decompose it. It is less effective against Lepidoptera (codling moth, etc.) since their digestive tracts are generally alkaline. Lead arsenate, on the other hand, is quickly decomposed under such alkaline conditions.

It has been shown that calcium arsenate brings on a "build-up" of aphids on cotton and also on potatoes, probably due to the relatively high soluble arsenic present.

Calcium arsenate is more easily removed from plant and fruit surfaces than is lead arsenate.

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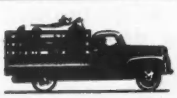

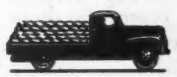

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TO PLANT OR NOT TO PLANT?

(Continued from page 19)

Predicting for Arkansas, J. R. Cooper, Head of the Department of Horticulture and Forestry of the University of Arkansas, thinks that there will be considerable planting of varieties of apples not later than Jonathan. Mr. Cooper believes that peach production will be somewhat increased; grape production will at least remain on par; and strawberry production will come back to what it was three years ago. The codling moth situation in Arkansas will force growers to plant comparatively early varieties of apples. Mr. Cooper thinks that varieties of peaches which ripen before Elberta are desirable for Arkansas. The later ripening varieties are questionable because of their longer exposure and danger to insects and diseases.

Dr. E. L. Overholser, former Head of the Department of Horticulture at the State College of Washington and now head of the horticultural work at Virginia Polytechnic Institute, tells us that in the state of Washington some continued expansion of plantings of fruit may be expected because of the development of the Roza irrigation district now under way, and because of the postwar development of the Grand Coulee irrigation project. "Furthermore," adds Dr. Overholser, "many acres that were pulled during the depression periods have been or are being replanted. Such expansion with production from young trees, however, may result in other less favored districts, especially with production from old trees encountering increasing difficulty in the profitable disposal of their fruit crops."

Speaking for the California Fruit Industry, which produces almost 50 percent of the total fruit crop of the nation, Dr. W. P. Tufts, Professor of Pomology at the California Experiment Station, reports that "In California during war years we have experienced a great reduction in acreage of small fruits, particularly strawberries. The present plantings should be expanded to at least the same acreage as before the war. California has experienced a tremendous increase in its population during the past five years, and as a consequence a tremendous increase in the market for these small fruits.

"Beginning about 1930 the pear acreage in California has been greatly reduced. At the same time there has been a tremendous increase in the demand for pears for use in fruit cocktail. This demand has been met in part by using fruit which formerly

was shipped fresh. For example, possibly 90 percent of the Hardy crop was exported largely to England. During the war this export market was entirely closed. The canneries found that this fruit was quite acceptable in fruit cocktail. An increase in California's pear acreage would seem to be entirely justified."

"Limiting his statements to conditions on the Delmarva Peninsula, A. L. Kenworthy, Associate Research Professor of the Delaware Experiment Station, states, "At the present time, there is a demand that peach and apple plantings be so planned that a complete crew may be kept busy throughout the season. This should also be considered during the postwar period. If one sticks entirely to apple varieties, there is a lag of approximately 30 days between the harvest of Williams Early Red and the earlier fall varieties of apples. At the present time, we do not have a satisfactory apple variety to fill this gap. This may be overcome by use of the proper varieties of peaches. Peach varieties may be kept in a continuous harvest by variety selections. Since peaches and apples are the main tree fruits raised on the Peninsula, the planting of other types will be light. However, I fully expect a rather rapid expansion in the acreage of strawberries and again the new marketing conditions will enable us to reach further markets than we have been able to reach in the past with this product. Blueberries also have a potential place as a major fruit crop on the Peninsula."

Since the strawberry is so well-adapted for freezer locker plants, Dr. H. P. Stuckey, Director of the Georgia Experiment Station, and his associates look for a considerable expansion in its culture for the reason that it can be planted (in the South) in the fall and produce a good crop of fruit the following spring. "We look for some expansion also in the demands for raspberries in sections where raspberries can be grown successfully," says Dr. Stuckey. "Unfortunately, however, they are not well adapted to the lower South."

It is the opinion of Dr. W. F. Pickett, Head of the Department of Horticulture at Kansas State College, that fruit plantings could be re-established in many areas in the Midwest. Along this line, Dr. Pickett has stated, "Adapted varieties of apple, cherry, grape, strawberry, peach, and some of the bush fruits could be planted to advantage in most of the counties in the eastern half or third of Kansas. The fruit could be grown with the idea of selling it on the local market rather than in normal commercial

(Continued on page 24)

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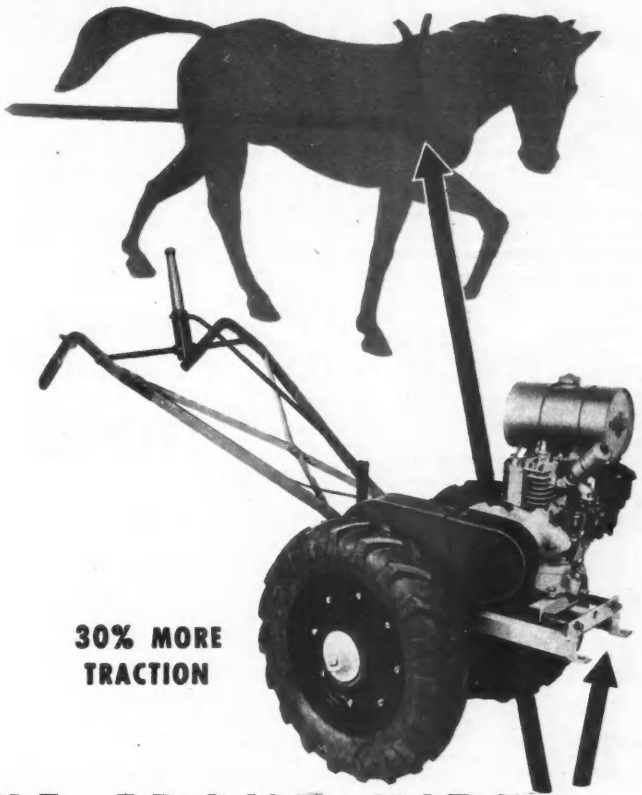

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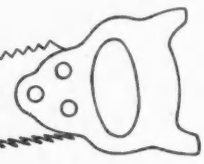

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From where I sit ... *by* Joe Marsh

Herb's got a Great Little Wife

Everybody's talking about what a grand job Herb Helm is doing since his boy went to war and left him to run the farm single-handed. He's producing almost as much as before, but he never says a word of complaint.

Good for Herb! But *I'd* like to say a word for Mary, Herb's wife. She runs the house, cooks the meals, takes care of the children, works on salvage drives and lends a hand at the Red Cross. And that's tiring work for any woman!

Yet when Herb comes in—too tired to talk or watch where he drops his ashes, maybe—she makes allowances, keeps smiling, brings him a restful glass of beer, and makes enough conversation for them both. Next morning, Herb goes back to work refreshed and cheerful.

From where I sit, women like Mary are doing a great war job themselves . . . being tolerant and kind to husbands who are under wartime strain. Bully for them!

Joe Marsh

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TO PLANT OR NOT TO PLANT?

(Continued from page 23)

channels. In order that this type of venture could succeed it is absolutely essential that the right man be located on the right farm. When these conditions prevail, provided the grower has proper financial status, the outlook is promising in the opinion of the members of this staff."

Dr. J. C. Miller, Head of Horticultural Research at the Louisiana Experiment Station, believes that fruit plantings should be extended, particularly standard fruits such as peaches, strawberries, apples and grapes. Dr. Miller thinks that we could use earlier varieties of higher quality and varieties which will store and handle better.

W. H. Alderman, Chief of the Division of Horticulture at the University of Minnesota, feels that there could be an expansion with raspberries and strawberries. "The reason for this," says Professor Alderman, "is based partly on the fact that strawberry acreage is at a very low point at the present time; the raspberry production of the country has never been very high. By all means the varieties selected for planting should be those that are adapted for freezing and preserving, as well as for fresh fruit. In the apple industry we must realize that there has been a considerable period in which planting has not been adequate to furnish a replacement for trees that have been going out. In many of our producing sections, the next ten or fifteen years will throw a lot of orchards into the old age, non-profitable class. In most regions these old orchards should be replaced by new ones and in some sections a definite increase in planting would be appropriate. For instance, the upper Mississippi Valley region including a part or all of the states of Wisconsin, Iowa, Minnesota and Nebraska are capable of producing an excellent grade of market fruit and they have an active home market which will consume several times the present production and have only a short haul to good markets just at the edge of their territory. The advent of new varieties adapted to this area has made apple growing a very attractive proposition, and in this region considerable expansion of the industry can be justified."

In Nebraska, E. H. Hoppert, Extension Horticulturist of the University of Nebraska, believes that plantings could be extended to sour cherries, pears, and small fruits like strawberries and raspberries. Says Mr. Hoppert, "If we were to have a grape juice factory or winery in the

(Continued on page 26)

DESIGN FOR ORCHARD PLANTING

(Continued from page 11)

cult. The practice of using "fillers" has been found largely in apple orchards where the permanent trees are spaced 35 to 40 feet apart. The filler trees being set between the permanent trees in one direction. Peaches, cherries and pears have been used for this purpose but none are recommended at present. The best plan is to plant early bearing varieties of apples such as Jonathan, Grimes Golden, Golden Delicious, Rome Beauty or Stayman Winesap.

The question of planting distance has never been completely settled, and it probably never will be because each orchard presents a different planting problem. Some authorities recommend close planting with a greater number of trees per acre. Those advocating orchard rotation have in some instances followed this method because it gives a higher acre yield and income from a young orchard. When the trees become large and crowded they are pulled out and the grower has another planting coming on to take its place. There are of course many modifications of this system.

Others will propose the wider distances of planting. They will direct your thoughts to the advantages of larger and more productive trees, often with one planting lasting a lifetime or more. This is the older of the two general methods and the one most widely used. Over a period of years the acre yield will no doubt be greater than under the previous system, but care and operating costs may also be proportionately greater.

The chief criterium in deciding the best planting distance is, of course, the size of the tree expected at full maturity. The ultimate size of the tree is determined by the fertility and depth of the soil, amount of rainfall and available soil moisture, amount and type of pruning, cultural practices, and the kind and variety of fruit.

In spite of the variability in tree growth and size, planting distances are fairly consistent for a given fruit. Tree fruits are generally planted at the following distances:

	Feet
Apple	32 to 45
Pear	25 to 35
Apricot	20
Peach	20 to 25
Plum	20 to 24
Cherry, Sour	24 to 30
Cherry, Sweet	25 to 30
Quince	18 to 22
Dwarf Trees	10 to 15

(Continued on page 27)

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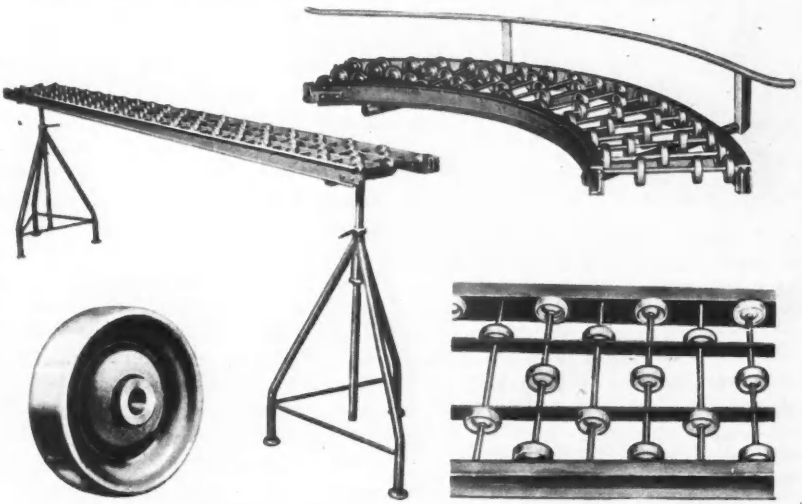

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TO PLANT OR NOT TO PLANT?

(Continued from page 24)

Missouri Valley where thousands of acres of good grape land are in existence, the grape growing business could be expanded appreciably."

Commenting for New Hampshire, Dr. A. F. Yeager, Head of the Department of Horticulture at the New Hampshire Experiment Station, believes that in specially adapted locations fruit plantings might well be extended especially where high-quality products may be produced such as McIntosh apples in New Hampshire, blueberries where they are especially adapted, etc."

Dr. S. H. Yarnell, Chief of the Division of Horticulture at the Texas Experiment Station, states that, "In Texas, except for the southern part of the State, we are well supplied both with early to mid-season white varieties of peaches and with plantings of this type. Mild winters still limit commercial plantings of peaches in South Texas, and the Agricultural Experiment Station has a rather extensive breeding program aimed at solving this problem. For other peach areas, there is increasing interest in the new early yellow freestones, and new plantings of this type that can be shipped are likely to yield a profit."

Speaking for Vermont, C. H. Blasberg, Chairman of the Horticultural Department at the University of Vermont, says "That the new plantings which have been made in the past few years are still not sufficient to maintain our tree numbers." Professor Blasberg thinks that Vermont could still use more of the small fruits, particularly blueberries, strawberries, and raspberries. "Experiences of this year would seem to indicate that under conditions of high employment we also could use many more peaches," said Professor Blasberg.

H. L. Price, Dean of Agriculture at the Virginia Polytechnic Institute, has reported that he would not advise Virginia growers to undertake heavy and extended plantings at this time, although he believes that a reasonable amount of planting would seem wise, since so many of the older orchards are passing out of existence. "There is some likelihood of the peach planting to be over-extended in this area," says Mr. Price, "and fruit growers should be encouraged to diversify as much as possible."

In summing up the whole question of extended fruit plantings, T. J. Talbert, Chairman of the Department of Horticulture and Forestry at the University of Missouri, has wisely said, "If new plantings are made, it is obvious that they should consist of fruits well-adapted to the particular section and likely to be in the greatest demand. Varieties well-known on the markets, although not as high in quality or as desirable from other points of view, are apt to prove most profitable in the long run.

"Rarely, if ever, have a large number of producers received low or unprofitable prices on account of the overproduction of high-quality fruit. Generally it is the common or lower grades that "upset the apple cart" somewhere along the line. The fact has been pretty well-established that we do not need more orchards but we could use better ones to good advantage in every section of the country."

C. L. Burkholder, Assistant Chief in Horticulture at the Indiana Experiment Station, adds another point for growers to consider. "Regardless of the fruit under discussion," says Mr. Burkholder, "one of the foremost considerations is the matter of high production per acre. This year, for instance, fruit plantings throughout the Central West which were located on exceptionally good sites usually have a sufficient sized crop to bring a nice income to the owner and operator. On the other hand, orchards on poor sites in most cases lost the entire crop due to spring frosts and freezes. An annual production habit in any fruit is most desirable although this doesn't tell *all the story.* For instance, the York Imperial apple is a notorious biennial bearer but still over a 10-year period will make a very good production record per acre. The Summer Rambo is a good example of an apple variety with an excellent annual production record while, in the Central West, Delicious and the red strains of this variety have made a very poor total production record over the past 25 years. There are exceptions to this latter statement as for instance the plantings which have been made in some localities in southern Michigan. This brings out the suggestion that new plantings in any area should be quite largely based on the production record of these varieties in that particular region. This is something that the 'beginner' fruit grower rarely considers as he usually makes his variety selections from the most alluring colored plates in the nursery catalogue."

It is hoped that the above discussion on the subject of new plantings by a few of the country's horticultural experts will cause the grower to examine all the angles before he extends his plantings, and then, if he does so, to remember that the fruit and the variety should be adapted to the soil, area, and market outlet.

DESIGN FOR ORCHARD PLANTING

(Continued from page 25)

To determine the number of trees per acre multiply the distance the trees stand apart and divide the product into 43,560 square feet, the number in an acre. For example, an orchard is set 30 feet by 40 feet; 30 x 40 equals 1200 square feet. Then 43,560 square feet divided by 1200 square feet equals 36 trees per acre. The following table gives the number of trees per acre at the various planting distances.

Planting distance Feet	*Number of trees per acre Square or Rectangular Method*	*Triangular Method*
10 x 10	436	502
15 x 15	194	223
20 x 20	109	125
22 x 22	90	104
25 x 25	70	80
30 x 30	48	56
35 x 35	35	40
40 x 40	27	31
45 x 45	22	29
50 x 50	17	20

Once the planting plan is decided upon, the next step is to locate each spot that is to be occupied by a tree. A base line consisting of a road or fence or some other permanent line is selected. If none is available, a straight line of stakes across one side of the field will suffice. To speed up the operation these stakes can be set at distances equal to that between the trees in that direction. From this base line, another is laid off on one side of the field at right angles to the first. This can be done with a surveyor's instrument or a carpenter's square. This line is then measured off into distances the trees are to be set and stakes driven at each tree location. This continues until the stakes are properly set completely around the field. If the field is irregular, additional stakes may have to be set. From now on three men locate and set the stakes for the remainder of the field. One man sites from one base line of stakes, another man from the base line at right angles to it and the third man sets the stake where the two "sites" meet. This will be the location of the next tree. This procedure continues until a stake is set at every tree location.

To lay out a triangular or hexagonal planting requires a different method. A base line of stakes at proper distances is first laid out across one side of the field as in the above method. For an example, we shall say that the trees are to be planted 40 feet apart each way. Then from a heavy piece of wire or chain an equilateral triangle is made, each side being 40 feet long. A ring is placed in each corner of the triangle. Two of the rings are placed over the first two stakes of the base line. The third is stretched down till the sides are tight and a stake is placed in the ring. This triangle is moved across the base line in this manner and a stake driven at each tree location. The method proceeds in this manner from row to row until the entire orchard is laid out.

A planting board is used to get the trunk of the tree in the exact location of the stake, since the stake must be removed while digging the hole. For this purpose a board 4½ to 5 feet long and 6 inches wide is used. A V-notch is cut in each end and a larger U-shaped notch in the middle of the board. Before removing the stake, the board is placed on the ground so the stake fits into the U-shaped notch in the middle. Then a stake is driven in each of the notches at the ends of the board. Now the board and stake can be removed and the hole dug. When it comes time to set the tree, the planting board is again placed over the hole with the end notches around the stakes previously driven. The tree is placed in the hole and the trunk held in the U-shaped notch in the center of the board. Thus the tree will be in the exact location as the stake.

There seems always to be a tendency to dig tree holes too small. The hole should be large enough to accommodate all the roots without crowding. Any long or straggly roots may be pruned off to make setting easier. Some growers will dig the holes in the autumn, fill them with manure and leave until spring. Then the manure is removed and the trees set. Manure or fertilizer should never be applied around the roots at planting time.

In digging the holes the top soil should be piled separate from the lower or subsoil, for it is a good practice to apply the more fertile top soil around the roots and use the remainder of the soil to fill the hole. A fruit tree should be set at the same depth as it stood in the nursery or up to 2 inches deeper. Care should be taken not to set it too shallow or too deep since either case may cause the death of the tree. The soil should be made firm about the roots to prevent them from drying out. There have been some plantings made using peat moss, or some other highly organic material mixed with the soil in the bottom of the hole and around the roots.

If the soil is very dry the trees should be watered as they are set. This

(Continued on page 28)

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PLANTING THE GROVE

(Continued from page 12)

tory. In California the best time for planting is during the spring just after the first growth period is completed and before the second begins. In Florida the optimum time is during the winter months, or just after the rainy season begins in early summer. Most plantings are made between November 15 and February 15.

The best trees to purchase are those with one or two years' top growth of the bud on a 4- or 5-year-old root stock. Such a tree should measure at least five-eighths of an inch in diameter 2 inches above the bud union.

If the trees cannot be set immediately upon receipt, they may be heeled-in in a shady spot at about a 45 degree angle. Make sure to keep the roots moist.

If the young trees were not defoliated before being shipped from the nursery, they should be before, or at planting time. Any long, injured or broken roots are usually trimmed. The holes are customarily dug just before planting in order to prevent as much drying out of the soil as possible. In setting, the planting board is generally used just as in setting deciduous trees. In fact, the entire operation of tree setting, whether citrus or deciduous, is practically the same procedure.

If the soil is poor organically or low in fertility, a pound of good fertilizer may be incorporated with the soil to be placed around the roots of the tree. Raw ground bone may be used for the same purpose. This gives the tree a little boost to start with. Trees should be set at the same depth as they formerly stood in the nursery.

If single shoot trees are planted the general practice is to prune them back to about 18 inches in height, making the cut above a node. Branched trees are cut to spurs of 2 or 3 buds.

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ORCHARD PLANTING

(Continued from page 27)

can be done by filling the tree hole about three-fourths full of soil and then applying water around the tree, one to 2 gallons per tree. After the water has settled away the hole can be completely filled with the remainder of the soil.

The trees should be pruned slightly at planting time. This tends to balance the top growth with the more or less reduced root growth resulting from changing the tree location.

The question of when is the best time to plant an orchard has long been debatable, and it still remains so. In general, spring planting is followed in the more northern fruit sections and fall planting in the southern areas.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912, AND MARCH 3, 1933

OF AMERICAN FRUIT GROWER, published monthly at Cleveland, Ohio, for October, 1945.

STATE OF OHIO
COUNTY OF CUYAHOGA } ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared E. G. K. Meister, who, having been duly sworn according to law, deposes and says that he is the Business Manager of the AMERICAN FRUIT GROWER and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, American Fruit Grower Publishing Company, 1370 Ontario St., Cleveland, Ohio; Editor, J. H. Gourley, 1370 Ontario St., Cleveland, Ohio; Managing Editor, None; Business Manager, E. G. K. Meister, 1370 Ontario St., Cleveland, Ohio.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)

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3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

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5. That the average number of copies of each issue of this publication sold or distributed through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is.

(This information is required from daily publications only.)

E. G. K. MEISTER.
Business Manager.

Sworn to and subscribed before me this 14th day of September, 1945.

(Seal) J. Wilbur Corry, Notary Public.
(My commission expires April 1, 1947).

PLANTING THE VINEYARD

(Continued from page 13)

are used for planting. It is a good practice to grow a cultivated crop on the new vineyard site during the preceding year. Following this, a winter cover crop of rye or other suitable crop is plowed under early in the spring and the soil worked down in preparation for planting the vineyard. This provides ample organic matter to give the young plants a boost.

The distance plants are spaced depends upon the variety and the type of soil. Concord, Fredonia, Sheridan, Niagara and other vigorous varieties are planted 9 to 10 feet apart in rows 10 feet apart. Those varieties of less vigor, such as Catawba and Delaware, may be set 7 to 8 feet apart in the rows. It is not advisable to space rows closer than 10 feet, since it would make spraying and cultivation operations more difficult.

Grape plants may be set somewhat deeper than they were in the propagation row. The hole should be dug sufficiently large enough to accommodate all roots without crowding. Any long, broken or ragged roots may be removed before planting. After setting, the top should be pruned back leaving two healthy buds.

Planting may be done in the spring or fall, depending upon location, soil preparation and the grower's individual preference. In general, northern growers plant in the spring while those farther south may successfully plant in the fall.

Planting Vinifera Grapes

The Old World or Vinifera grapes, such as those grown in California and a few other parts of the Pacific coastal region, are less versatile in requirements than the American species. Most Vinifera varieties need a long, warm to hot, dry summer and a cool winter to grow into greatest productiveness. Any location where the summers are humid or where the winter temperatures drop below zero must be avoided. A long growing season is necessary to properly mature the fruit.

Time and amount of rainfall are important considerations in planting vinifera grapes. Rains are very necessary during the winter months. If rains are not prevalent at this time, plans for irrigation should be made. Excessive rains during the spring growing months will make disease control difficult, otherwise rain or irrigation at this time does not have any disadvantages. Dry periods are very important during the blossom period in spring and again during the ripening and harvesting period.

The European grape is found growing on many different kinds of soils in the world. But regardless of the kind or type of soil it must be well-drained. Heavy clays, shallow soils, and the strongly alkali soils produce only meager vines of short life. The deeper and more fertile soils have always produced the top quality and largest crops. It is always best to plant the type and variety of grape that experience has proved to be the best for that area.

The prospective vineyard site should be well-plowed to a depth of 8 or 10 inches before planting and worked down with a disc harrow. Any hardpan lying beneath the plow depth should be broken up to facilitate water drainage.

When vines are to be trained to the vase-formed system, a planting distance of 9 by 9 or 10 by 10 feet is desirable, with 18 or 20 foot avenues at regular intervals of from 300 to 600 feet. Trellised vines of raisin and table grapes are best spaced 8 by 12 feet.

Before planting, the vines should be pruned. The tops are cut back to a single spur of one or two plump buds, and all roots are removed from the top 8 inches of the vine. The remainder of the roots are cut to 3 or 4 inches in length. Care should be taken during planting to prevent the roots from drying out.

The hole for the vine should be dug slightly deeper than the plant is long. Then the plant is dropped into the hole and halfway covered with moist top soil. The vine is raised to proper location and the soil tramped around the roots. The two buds left on the plant should come right close to the ground level. Where bench-grafted vines are used, the graft union should be about 2 inches above ground. The support stakes are usually set after the vineyard is planted.

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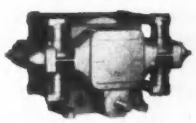

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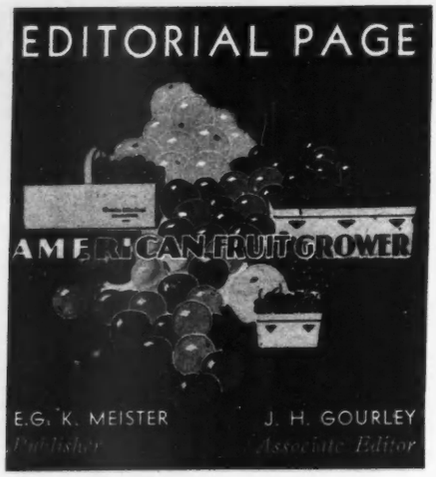

Out On A Limb?

TO PREDICT the future is certainly one way of going out on a limb and particularly at a time when momentous changes are bound to follow in the wake of peace and good fellowship. The horticultural prophets whose postwar opinions appear on page 9 under the title of "To Plant Or Not To Plant" did not go out on a limb and their recommendation of judicious planting is sage advice for all growers.

In connection with postwar thinking, it is interesting to observe the suggestions that came out of a recent meeting of eastern pomologists at New Brunswick, New Jersey, called by Professor M. A. Blake, Chief in Horticulture at the New Jersey Experiment Station. A summary of the advice of these men to fruit growers follows:

1. Remove orchards which are unprofitable either because of age, unfavorable soil or climatic conditions, or undesirable varieties.

2. No increase in the present total commercial production of tree fruits seems desirable under the apparent marketing conditions. New plantings should be made only to maintain present production and to secure a proper succession of plantings.

3. More thought and study should be given by many fruit growers to the possibilities of some diversification in their source of revenue aside from one kind of fruit.

4. Growers are advised to give more attention than previously to the selection of the site and soil for any new tree fruit planting and to the best land use on their own farm.

5. No varieties should be commercially planted without a searching investigation by the grower of their merits from the standpoint of both tree and fruit qualities and particularly with respect to their adaptability to the locality where they are to be planted.

6. Better varieties are needed in most districts.

7. Plant well-grown, vigorous, healthy, virus-free trees with uniformly strong, congenial rootstocks.

8. An increase in the yield per acre of a good grade of fruit is imperative.

9. Efforts should be made in cooperation with public and private agencies to reduce the complexity and cost of production and marketing.

10. Growers need to assume more responsibility for the condition of fruits delivered to the consumer.

Caution About DDT

MORE than a year ago DDT was apparently making phenomenal records in controlling insects. There was danger in the conclusion that we had at last a highly selective insecticide that would kill only destructive insects without being toxic or harmful to man. The public was led to believe in glowing newspaper and magazine articles that this insecticide could be used indiscriminately in the pantry, kitchen, bedroom and clothes closet. Such has not been the case and the caution expressed in an editorial in the June, 1944, issue of AMERICAN FRUIT GROWER entitled "Keep Your DDT Shirt On" must again be called to the attention of our readers.

There are today literally hundreds of manufacturers of DDT. Many are totally inexperienced in insecticide manufacture. A list of such producers gives the impression that every Tom, Dick and Harry is attempting to capitalize on the publicity and good will of this remarkable insecticide. Many attempts at fraud are already evident. The experienced fruit grower will take no chances and buy only from reliable companies, and hardly needs this word of caution, but the present stampede leads to two primary conclusions.

First, we need better regulations to control the manufacturing and labeling of insecticides. Under present laws, a DDT-kerosene mixture is not required to bear an ingredient statement on the label. In fact, it is permissible to state on the label of such a mixture, *Active Ingredients 100%*, since kerosene is also an insecticide. This makes it easy for the defrauding person to operate. The federal law must be changed to give purchasers protection.

The second conclusion is that it is more important than ever to buy from a standard and reliable producer. Large insecticide manufacturers, through knowledge gained in extensive research laboratories, are qualified to advise fruit growers and label their material to protect their customers.

Life of the Soil

IT IS NO mere figure of speech to refer to "the life of the soil." Without micro-organisms, both plant and animal, as well as macro-organisms, together with their source of energy (organic matter), we might as well have a mass of glass beads, purely physical, inert, and lifeless. But with them, dirt becomes interesting, a great biological and chemical laboratory.

When rocks disintegrate and lichens and mosses appear, then grasses, herbs, and woody plants, followed by their death and decay through the agencies of bacteria and molds, organic matter infiltrates the rock particles, life abounds, water is retained, nutrients become available, and the ever recurring phenomenon of soil building is in process. When one tramps a rocky shore, climbs a mountain, or even watches an old tree stump decay, he witnesses the formation of soil. Who is not stirred as he thus realizes that the earth is in constant change, that there is a constant building up and tearing down, that the process is both creative and destructive?

But what of this mystical substance we call organic matter which wears an agricultural halo and which is essentially the basis of the life of the soil? From whence does it come, how long does it stay, and where does it go? Apparently there are many misconceptions regarding it and doubtless no one understands it fully but probably all would agree that it is this stuff that makes "the good earth."

In simple terms, soil organic matter is the total plant and animal material, living or dead, which occurs within the soil. Humus, however, is that fraction which has undergone decomposition and can no longer be recognized as straw, leaves, roots. It often accumulates under water as in peat bogs and muck areas; it covers the forest floor and is usually abundant beneath old established sods. It is when man steps into the picture that it tends to disappear. The man who leaves the highest cloud of dust behind the cultivator is not the best farmer. It is always a transitory, come and go, material. Oxidation occurs, bacteria and many chemical processes are at work and these are speeded up by thorough tillage. In sum, it is much like the old fairy tale of the man who had to run as fast as he could to stay where he was.

THESE MEN
Are Getting Ready Now to take Over

How these babies can eat—and grow! And no wonder. Not just three times a day, but every four hours, a lusty wail announces that a husky appetite is all sharpened up again. Eleven pounds at two months, 16½ pounds four months later. The most scientific diets ever to be set before an infant are today building sturdy bodies and alert minds to take over tomorrow's more complicated national affairs.

Anheuser-Busch supplies specially grown food yeasts which add nutritional enrichment to a majority of the dry cereal formulas forming the daily diet of America's younger generation.

In close co-operation with the national effort to provide better nutrition for all, the ten laboratories of Anheuser-Busch are deep in an expanding program of nutritional research which we know will ultimately contribute much to the enjoyment of a healthier, happier life and may even contribute to a lengthier life span.

Other food yeasts, rich in protein and high in Vitamin B Complex factors, are being supplied to processors to fortify the diets of Army and Navy forces. For the pharmaceutical and food field, Anheuser-Busch is the largest source of natural B Complex vitamins. *Do not confuse these specially grown dry food yeasts with the compressed fermentable types you've previously known.*

MANUFACTURERS *of food and drug products interested in nutritional fortification; hospitals, war plants, institutions; physicians and dietitians requiring dietary supplements rich in proteins and high in Natural B Complex Vitamins, are urged to write us for complete information on the nutritional value and multiple uses of "Dried Food Yeasts".*

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shows miracle fruit as grown on trees specially selected for home planting as urged by U. S. Gov't.
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Hurry to get FREE COLOR CATALOG (over 1 foot long) while they last!
MANY WEIGH 1 POUND EACH
NEW HAL-BERTA Giant Peach (U. S. Patent)
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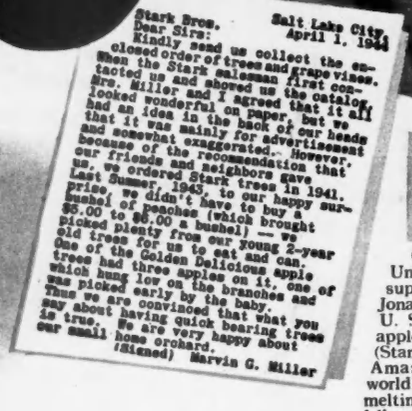
STARKING NEW Double-Red Delicious Apple (Trade-mark)
New U. S. Patent MONTEARLY and MONTIATE Cherries
COUPON BRINGS prize tree offer to encourage home-planting

New Fruit Tree Marvels

undreamed-of in Grandfather's time

The amazing new improvements of Stark and Burbank that bring you trees propagated direct-in-line from record-bearing parent trees... many

Bear larger fruit! Bear 1 to 3 years sooner*! or Bear up to 40 bushels!



Stark Bros. Salt Lake City
Dear Sirs: April 1, 1944
Kindly send us collect the enclosed order of trees and grape vines. When the Stark salesman first contacted us and showed us the catalog, Mrs. Miller and I agreed that it all looked wonderful on paper, but we had an idea in the back of our heads that it was mainly for advertisement and somewhat exaggerated. However, because of the recommendation that our friends and neighbors gave us, we ordered Stark trees in 1941. Last Summer, 1943, to our happy surprise, we didn't have to buy a bushel of peaches (which brought $5.00 to $6.00 a bushel) — we picked plenty from our young 2-year old trees for us to eat and can. One of the Golden Delicious apple tree had three apples on it, one of which hung low on the branches and was picked early by the baby. Thus we are convinced that what you say about having quick bearing trees is true. We are very happy about our small home orchard.
(Signed) Marvin G. Miller

Astounding results from scientific selection, special super heavy root system grafting and "Fattening" in selected soils before shipping

HERE NOW, in America's most alarming fruit shortage, come trees of the horicultural wizards, Burbank and Stark, offering fruit abundancy quickly for individuals with even as little as 20 ft. square of ground.

So vastly improved have some varieties of fruit trees become by selecting the heaviest bearers, or the quickest to fruit, or the trees with largest, most vividly colored, most delicious fruit, that the benefits of fruit growing have multiplied many-fold. Thousands of these trees, selected over years and years, are already in the grounds of thousands of delighted growers in virtually every state of the union, and on almost any kind of land where usual farm crops grow.

These tree miracles—are the "expert's choice" to produce fruit as quickly as possible for home and commercial planting as urged by U. S. Gov't.

Pay Cost Before Ordinary Trees Bear*

In home and farm orchards throughout the country you'll already find these living testimonials to the life work of men like Burbank and Stark—fruit trees that are bearing rich, delicious, premium bringing prize fruit years younger. Yes, these trees bear fruit so young that some often pay back the full tree cost before ordinary trees bear at all.

Amazing new color Year Book free Tells how—shows how

This greatest of all fruit catalogs is bringing praise from people in every walk of life from all over the country. And no wonder; it shows how and why it is easier to grow prize fruit than ordinary fruit.

This master book of horticulture shows how you may work wonders with these wonder trees. There are 72 pages, abounding with true life pictures—actual live fruit photographs that make selection easy. Valuable information on every page. Simple, easy to understand directions on what to do and how to do it, make fruit growing simple and easy. Check coupon to get this magnificent art color catalog of miracle fruit, a book over a foot long—free while they last.

Health authorities are urging people to eat twice as much fruit. More fruit will be needed to supply the devastated countries of Europe. Yet, the new U. S. census of agriculture reveals already an alarming fruit shortage—only ½ as many apple trees as there were ten years ago. That's why our government is urging more home planting of fruit trees.

The Wonder Book of Wonder Fruit Trees

Stark's glorious wonder book of wonder trees and shrubs shows you and other patriotic Americans how to replace ordinary fruit trees with fruit trees of Burbank and Stark—the trees with a record of bearing earlier—and bearing more bushels of top quality, more vividly colored, premium price fruit. The magnificent new Starking (trade-mark), the King of all Red apples—red all over weeks before ripening. Stark's Golden Delicious, glorious new

20% VICTORY GARDEN DISCOUNT
Tree Collections to Cooperate with U. S. Gov't. Drive on Fruit Shortage.
MAIL COUPON TODAY!

Quality Queen of all yellow apples. Unequalled in richest, juiciest flavor—superior in young and heavy bearing! Jonared, the gorgeous new (Stark U. S. Patented) double-red Jonathan apple. The gigantic new Hal-berta (Stark's U. S. Pat.) titan of all peaches. Amazing mid-season producer. The world's largest peach—delicious, firm, melting lusciously juicy, many weigh 1 lb. each! All the exclusive new varieties sold only by Stark. Also, amazing new hardy Cherries—and hundreds of other Stark fruit trees, shrubs and roses all true-to-name and true to strain—and safe arrival guaranteed.

Check Coupon for These Priceless Books

1. Free Big new 1946 prize fruit book and details of prize free offer.
2. Free Stark Fruit Planting Guide Book. This practical guide, the result of over a century of research and tests, will show you actually how to select trees and raise an orchard for maximum yield and profit. It will be sent free with the big 72 page Stark color book of fruits, shrubs and roses that show the wonderful new horticultural triumphs.
3. Free New Simplified Landscape Booklet—how to landscape your own home grounds. Check and mail coupon today. Stark Nurseries, Box B-45, Louisiana, Missouri. Largest in the World, Oldest in America. Branch nurseries coast to coast.

*Catalog tells young bearing age of new varieties

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Owing to shortage of salesmen a coupon brings you a glorious new catalog—over 300 color plates from live fruit—535 Choice varieties. Don't Delay—Mail Today. FREE all these Booklets

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The new fruit creations of Luther Burbank, Horticultural wizard, are propagated and Sold Exclusively by Stark Bro's. *Luther Burbank*

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Gentlemen: Send me Free: ☐ New, big 1946 PRIZE FRUIT BOOK and details of Prize tree offer.
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☐ Check here if interested in liberal Weekly Cash Income Plan for Spare-time selling Stark prize trees.

"I Sold $1,760.80 worth of trees one week spare time"
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Thousands are planting home orchards as urged by U. S. Gov't. This opens an amazing opportunity for men and women to make real money selling for Stark Bro's., America's biggest and oldest nursery. Rev. E. R. Eckerly, Indiana, sent in unusual sales of $1,760.80 in one week. All over the country Stark representatives are making nice extra income selling exclusive patented varieties of Stark-Burbank trees. 130 years in business, 76 years of advertising, plus thousands of satisfied customers have made Stark trees, shrubs and roses preferred the country over. No investment. No experience to start. Free outfit. Check coupon to get liberal weekly income plan. MAIL TODAY.